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Entomological News

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

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VOLUME XVIII, 1907.

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AND

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Two new North American Dragonflies (Odonata).

By E. B. Williamson.

Boyeria grafiana n. sp.

Abdomen ♂, 48-51; ♀, 46½-47½ mm.

Hind wing ♂, 40-43; ♀, 43 mm.

Specific characters: Body colors, especially the thorax, generally black and grav with little trace of the fulvous which characterizes *B. vinosa*. The dark brown basal wing spots of *vinosa* reduced to a trace, and the wing membrane clear hyaline (excepting more or less fumose beyond the stigma) as contrasted with the decided fulvous of *vinosa;* venation less complex than in *vinosa.* Stigma paler than in *vinosa* and .5 mm. shorter. A decidedly more robust species than *vinosa;* four dried males of *grafiana* weighed 12 grains, and four of *vinosa* weighed 9½ grains.

♂.—Abdominal appendages variable but similar to those of *vinosa*, generally more robust (two males of *grafiana* and *vinosa* from Ohio Pyle, Penna., Sept. 23, 1906, have the superior appendages respectively 4½ and 5½ mm. long) with the sub-basal inferior tooth less developed, and the inferior appendage dark colored and not yellow as in *vinosa*. Abdominal segments 9 and 10 similar in general color, greenish blue, while in *vinosa* segment 10 is fulvous and 8 and 9 are decidedly more brown than 10.

♀.—Abdominal appendages very short, about the length of segment 10; in *vinosa* the appendages are at least 1½ times the length of 10.

Color comparison of males based on two of each species collected by J. L. Graf at Ohio Pyle Penna., Sept. 23, 1906

B. vinosa	*B. grafiana*
Face green obscured with brownish	Clear green
Dorsal thoracic stripes narrow, each divided for a short distance.	Wider, continuous but narrowed where the separation occurs in *vinosa*
Mesepimeron and metepimeron each with an inferior rounded yellow spot.	Each with a rounded blue spot, the spot on the metepimeron showing traces of yellow
Mesepimeron and metepisternum each with a small bluish spot at base of wings.	Spots larger and more distinctly blue.
Metepimeron uniform brown with exception of yellow spot mentioned above.	With a large distinct blue spot at wing base
Wing bases above and between the wings with few inconspicuous blue spots	With distinct and more numerous clear blue spots
Abdominal segment 2 from above with small median basal spot, and a transverse apical spot which is interrupted at the median line.	Similar and also with a spot at the median transverse carina similar to the apical spot
Segments 3 5 each with a very small apical spot on either side of the median line	Spots clearer and more sharply contrasted with the surrounding color.
Segments 3 8 each with a very small obscure pale spot at the transverse carina, each spot divided by the dorsal median longitudinal carina	Spots clear blue, sharply defined
Apical half of 8 and all of 9 and 10 obscure brownish yellow, each with a dorsal median brown area, 10 decidedly more yellow than 8 and 9	8 brownish with a wide black median longitudinal stripe back of the transverse carina, 9 and 10 pale greenish blue, but little if any obscured and with black markings more distinct and definite than the brown markings in *vinosa*
Seen from the side segments 4 8 each with a very small obscure yellowish spot below, the transverse carina dividing each spot more or less completely into two spots	Spots large, clear blue, the color following up the transverse carina to the dorsal spots
Superior appendages dark brown inferior yellow, extreme apex dark	Both superiors and inferior dark brown
Width of head, 9 mm	10 mm.

Venational characters based on tabulation of 10 males of each species.

Antenodals in front wing	17	18	19	20	21	22	23	24	25	26		Average.
Boyeria vinosa		1=5%	1=5%		3=15%	4=20%	3=15%	5=25%	1=5%	2=10%		22.7
Boyeria grafiana	1=5%	2=10%	1=5%	5=25%	2=10%	6=30%	2=10%	1=5%				20.8
Antenodals in hind wing	13	14	15	16	17	18	19	20				
Boyeria vinosa	1=5%	1=5%		4=20%	6=30%	4=20%	3=15%	1=5%				17.1
Boyeria grafiana		1=5%		11=55%	8=40%							16.25
Postnodals in front wing	15	16	17	18	19	20	21	22	23			
Boyeria vinosa				1=5%	10=50%	2=10%	3=15%	1=5%	3=15%			20.1
Boyeria grafiana	1=5%	3=15%		2=10%	6=30%	5=25%	1=5%	2=10%				18.8
Postnodals in hind wing	17	18	19	20	21	22	23	24				
Boyeria vinosa	2=10%	2=10%	2=10%	3=15%	2=10%	3=15%	3=15%	3=15%				20.85
Boyeria grafiana	4=20%	7=35%	3=15%	3=15%	1=5%		1=5%					17.75
Cross veins in median space of front wing	3	4	5	6	Same of hind wing.				3	4	5	6
Boyeria vinosa		2=10%	12=60%	6=30%						5=25%	13=65%	2=10%
Boyeria grafiana	1=5%	16=80%	2=10%	1=5%					6=30%	12=60%	2=10%	
Cross veins in cubital space of front wing, not counting one forming subtriangle	3	4	5	6	7	Same of hind wing.			3	4	5	6
Boyeria vinosa	1=5%	9=45%	7=35%	3=15%					1=5%	11=55%	6=30%	2=10%
Boyeria grafiana		10=50%	9=45%		1=5%				2=10%	13=65%	5=25%	
Transverse cross veins in triangle of front wing	3	4	5	Same of hind wing	2	3	4	Cells in anal triangle.		3	4	5
Boyeria vinosa	6=30%	12=60%	2=10%		1=5%	13=65%	6=30%			6=30%	2=10%	12=60%
Boyeria grafiana	11=55%	9=45%			5=25%	14=70%	1=5%			15=75%	1=5%	4=20%
Rows of cells between M_2 and R_s at widest point	3	4	Rows of cells between R_s and radial supplement in front wing.				1	2	Same in hind wing.		1	2
Boyeria vinosa	21=52.5%	19=47.5%					6=30%	14=70%			11=55%	9=45%
Boyeria grafiana	40=100%[1]						6=30%	14=70%			16=80%	4=20%
Rows of cells between M_4 and median supplement	1	2	Rows of cells between Cu_2 and hind margin of wing at widest point in hind wing.					4	5	6	7	8
Boyeria vinosa	4=10%	36=90%							2=10%	5=25%	12=60%	1=5%[2]
Boyeria grafiana	10=25%	30=75%						1=5%	3=15%	15=75%	1=5%	

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[1] In front wing of a ♂ from Searchmont, Ontario, practically only 2 rows, as there is

[2] In this ♂ from Muncie, Indiana, in one front wing and both hind wings Sc is carried

Material studied.—With the exception of two males of *vinosa* and one male of *grafiana*, all from Old Forge, N. Y., in the collection of Professor Needham, this material is in my collection. Fifty-two males and seven females of *vinosa*, and fourteen males and two females of *grafiana* have been studied.

B. vinosa.—Little Jelloway, Knox County, Ohio. August 18, 1905. ♂. J B. Parker.
Winona Lake, Indiana, 1901. ♂. E. B. Williamson.
Muncie, Indiana, July 11, 1903, taken in window in a store, ♂. E. B. Williamson.
Russell Stream, N. E. Carry, Maine, August 28, 1899, 8 ♂♂. F. L. Harvey.
Millinocket, Maine, Stone Dam, September 4, 1903, ♀, indicated as taken in copulation with a ♂ *Æshna sp.*
Old Forge, New York, August 22, 1905, 2 ♂♂, J. G. Needham
Ohio Pyle, Penna All collected by J. L. Graf. September 8, 1901, 3 ♂♂; September 10, 1905, 8 ♂♂, 4 ♀♀, October 1, 1905., 2 ♂♂; September 23, 1906, 2 ♂♂, 1 ♀.
Heyden, Ontario, Canada. Collected by E. B Williamson July 31, 1906, ♀; August 2, 1906, 5 ♂♂; August 3, 1903, ♂*
Searchmont, Ontario, Canada Collected by E. B Williamson August 6, 1906, 7 ♂♂; August 7, 1906, 3 ♂♂. August 8, 1906 6 ♂♂; August 9, 1906, 2 ♂♂.

B grafiana—Cave Branch, Ky, August 28, 1898, ♂. J S. Hine
Old Forge, New York, August 22, 1905, ♂, J G Needham
Ohio Pyle, Penna Collected by J L. Graf September 10, 1905, ♂; September 24, 1905, ♂; October 1, 1905, ♂, September 23, 1906, 2 ♂♂
Heyden, Ontario, Canada Collected by E. B Williamson August 2, 1906, ♂
Searchmont, Ontario, Canada Collected by E. B Williamson August 6, 1906, 2 ♂♂; August 8, 1906, 3 ♂♂; August 9, 1906, ♂, 2 ♀♀

This species is very properly named for J. L. Graf, a devoted and careful, though withal, silent student of nature, who first detected a difference in the Boyerias at Ohio Pyle In the autumn of 1905, among a box of specimens he sent me, he indicated on the envelope of a Boyeria, "colors peculiar" In reply to my inquiry, under date of October 4,

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*Hawking after sunset.

1905, he wrote, "The variety of *B. vinosa* you mention is not uncommon at Ohio Pyle. I have succeeded in taking three specimens, though I saw a number of others. Their difference from typical *vinosa* is apparent at a glance, even while they are on the wing, their pale blue markings in marked contrast to the almost uniform brown appearance of typical *vinosa*. In manner of flight I could detect no difference in the two varieties. They both prefer the ripples along the river where there are many stones, and their flight is usually just along the water's edge and but a few inches above the rocks. I observed females of typical *vinosa* ovipositing while at rest on rocks in the damp algæ just above the water." In Canada I was able to distinguish the two species readily on the wing by the color of the apical abdominal segments.

As above indicated, I am indebted to Professor Needham for three specimens studied. In his laboratory we examined together some of my material, and he regards *grafiana* as distinct from *vinosa*. Dr. Calvert has sent me notes on venational characters of specimens of the genus in Philadelphia. And on October 11, 1905, Professor Hine wrote me, "There is in the collection here (O. S. U., Columbus, Ohio,) one specimen taken at Orwell, Ashtabula County, Ohio, September, 1894, by E. E. Bogue, and labelled *vinosa*, by Dr. Kellicott. This dragonfly has the characters you mention of the new species."

Somatochlora charadræa n. sp. (*charadræus* Gr., from a mountain torrent).

Abdomen, ♂ 35; hind wing 35 mm. (*S. linearis*, abdomen 45, hind wing 43).

Labium pale yellow; labrum dark yellow, edged with brown; clypeus brown; frons dark yellow, for nearly its entire width above and for a short distance in front, metallic blue; vertex black, the apex yellow; occiput dull yellow; rear of eyes black.

Thorax brown, metallic reflections most evident below on the mesepimeron and metepimeron, each of which has a bright yellow stripe, on the first of nearly uniform width and nearly the length of the sclerite, on the second widened and shortened to form an inferior rounded spot; middorsal carina and interalar sclerites yellow. Costa pale yellow to its termination, and antenodals and nodus largely of the same color; stigma black; all four triangles once crossed;* seven

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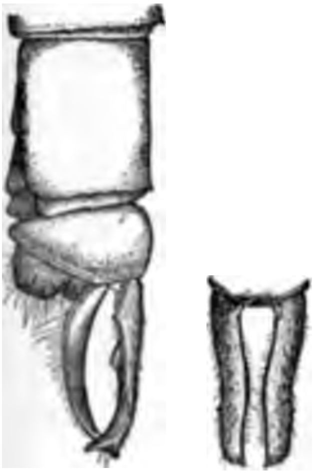
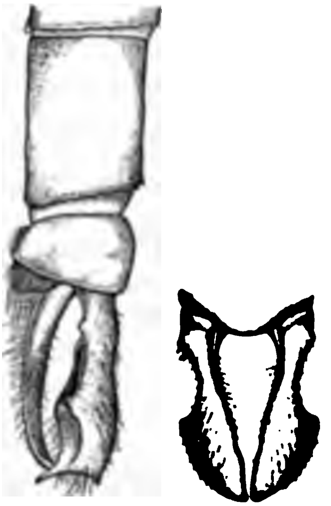
*Needham, Aquatic Insects in the Adirondacks, N. Y. State Museum, Bulletin 47, 1901, p. 484, in the Key to N. A. genera of Cordulinæ (s. str.) erroneously places *Somatochlora* under his section "*cc* Triangle of hind wing without cross vein, open." Normally *Somatochlora* has this triangle once crossed. Of 40 hind wings of *Somatochlora elongata* which I studied, the triangle in two left wings was not crossed.

antenodals in front wings and five in hind wings; seven postnodals in front wings and eight and nine in hind wings. Legs black, femora of first and second pair, especially the first pair and especially on the inner surface and basally, with light brown.



Figs. 1 and 2.—Appendages of *Somatochlora charadraea*. Bear Creek, Canon, Jefferson Co., Colorado, July 31, 1898. E. J. Oslar collector. Type ♂, collection E. B. Williamson.



Figs. 3 and 4.—Appendages of *Somatochlora linearis*, Lake Forest, Illinois, June 27, 1894. ♂, collection J. G. Needham.

Second abdominal segment with a basal, lateral, inferior and a subapical, lateral, superior spot yellow; genital lobe long, yellow, margined with brown. 3 with a basal, lateral, superior and a basal, lateral, inferior spot yellow, these spots not so sharply defined as the markings on 2, remainder of abdomen, including the appendages, black.

Described from a single ♂ in my collection, collected by Ernest J. Oslar, Bear Creek Canon, Jefferson Co., Colorado, July 31, 1898.

So far as form of appendages go, this species finds its closest ally in S. *linearis*. No other species known to me approaches these two species in this type of appendage. S. [illegible] is known to me only by DeSelys's description of the female, but it certainly cannot be associated with *charadraea*. In addition to differences indicated in the figures of appendages, *charadraea* is separated from *linearis* by a number of characters, including size, reduction in number of antenodals and coloration. My type has been examined by both Dr. Calvert and Professor Needham. In the figures of appendages of *charadraea* it should be noticed that the apex of the abdomen has been flattened, so, in profile, segments 9 and 10 appear too wide, and in dorsal view, the apex of 10 is compressed and the superior appendages are crowded together.

Under date of November 14, 1906, Mr. Oslar writes concerning the single specimen:

"I took it at an altitude of about 8000 feet, July 31, 1898, in Bear Creek Canon, Jefferson County, Colorado. At the place I took it there were two, but, on account of its wariness and the almost inaccessible character of its haunts (on willows overhanging the swift and breakneck dashing Bear Creek), I was unable to secure the other specimen. The one captured was taken with difficulty, as it kept just out of reach of the net. It appeared a weak flier, however, and my opportunity came when an unusually strong gust of wind blew it towards me. I have never seen the like of it since, though I have visited the spot a number of seasons. I have always suspected that it might be new."

Notes on Plusiotis beyeri Skinner.

By C. R. BIEDERMAN, Palmerlee, Arizona.

Most of the letters I get ordering *P. beyeri,* contain questions about the insect, some complain of the high price, stating that it is reported this species is all over this part of the country and is plentiful. The latter statement is only partially correct, since it is not found above 6,500 or below 4,500 feet. Within that space I have found it for many miles along the Huachuca range. I have known *P. beyeri* since 1904. That season I found two specimens; next year, 1905, four; this season, 1906, I made a special study of this large and handsome *Plusiotis*, and from my experience I may safely conclude the following: That while there are a good many of these beetles within the space mentioned, I have utterly failed to establish a rule whereby to locate a single one. There is no time of day it is not on deck; the noise of his wings in the night can be heard twenty feet away, whereas his flight in daytime is almost without sound. The length of his life is about three months, commencing on the 6th of July, when I found the first one while raking away leaves for a garden-bed. I concluded that this time of year they might be hidden under leaves, and so I started to rake leaves. I think I worked about ten hours, raked over a half acre of ground and never found another; this did not cure me, however, for at odd times I tried it again, and may have raked over in all about two acres without getting another, although I found some other good things, among them a litter of skunks under a log. The next find I made was a fine female, sitting at the foot of a large oak. This gave me the idea to examine all the old oaks for a mile either way along the Canon, but no sign of *beyeri*; the fact is, I found only three on the bark of trees; one, six feet up, the other twenty feet. I also found them in the road or trail, several crushed by animals, but all wide apart, as to both space and time. I found them copulating on the high branches of young and old oak; this set me to look at trees for miles and for days without result, except disgust. For several days I did not look for them, but collected other material, yet the habit once formed for looking for certain things persists so strongly that I could not keep from watching the tree tops. Although I was not thinking of *Plusiotis beyeri*, my eye caught the forms of two hugged close among the leaves. Before I had made up my mind how to take them, I saw two more higher up, and I felt like an Apache roasting a lot of sheep guts on a bed of hot coals. Thinking this the right time to hunt him good and hard, I looked for a week and did not get one. Later I found one here, one there; hanging to the dead stalk of a columbine, on the top of a bare precipice, in a prospect hole, an old well in a privy, a blacksmith shop, and one day in an old shoe. This is the way of *beyeri*, he is everywhere and nowhere in particular. When he walks on the ground he reels like a drunkard, and when he rolls over on his back it takes him half an hour before he makes a motion to get on his feet.

So far as I can find out, he has no likes or dislikes to make him an easy capture, there is no particular place he prefers to stay, he don't belong to any club, he don't play golf or other games. Clubbing a tree for him won't do much good, as he grits his teeth and stays there, nine times out of ten. I conclude that he will not be exterminated by collectors, and before all the latter are supplied with a good series, some method of propagation must be invented.

Some recent work on the development of Hymenopterous Parasites.

By Dr. Wm. A. Riley.

In the Entomological News for September, 1905, I called attention to the discovery, by Marchal, of a new type of development, occurring in certain parasitic Hymenoptera. In studying the development of *Ageniaspis fusicollis* and of *Polygnotus minutus*, Marchal* found that a single egg, in the morula stage, would spontaneously break up and give rise to many distinct individuals. I referred to the observations of Pergande and of Giard, who found nearly three thousand individuals of *Litomastix truncatellus* in a single larva of *Plusia gamma*, and to Giard's prediction that here, too, would be found a case of polyembryony.

There has come to hand a paper by Filippo Silvestri† who has studied the life history of this parasite and brought to light many interesting and striking facts.

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*Marchal, P. 1904. Recherches sur la biologie et la développement des Hyménopteres parasites. 1. La polyembryonie spécifique ou germinogonie. Arch. zool. exp. (4) ii, pp.257-335, pls. ix-xiii.

†Silvestri, F. 1906. Contribuzione alla conoscenza biologica degli imenotteri parassiti. 1. Biologia del Litomastix truncatellus. From Ann. Scuol. Agric. Portici., vi. 51 pp., 5 pl. and 13 text figs. This paper is a second preliminary note. The first, which summarizes the essential features of Silvestri's work, but is not illustrated, appeared Nov. 10, 1905, in the Rendic. R. Acad. Lincei. ser. 5, vol. xiv. pp. 534-542.

Litomastix truncatellus oviposits in the egg of various species of *Plusia*. The eggs of the parasite, which may be fertilized or parthenogenetic, are deposited singly, but occasionally the same female returns and deposits a second egg within that of the host. Several females may select the same egg, but this probably occurs rarely under natural conditions. The course of development of the fertilized and the parthenogenetic eggs is the same but, as in the bees, the fertile egg gives rise to females, while the unfertilized egg produces only males.

Silvestri found in the maturation and early segmentation stages of the egg, features of great interest from an embryological viewpoint, but too technical for discussion here. It may be mentioned in passing, that the polar nuclei and their protoplasm do not degenerate but, later, form an envelope which surrounds the germinal region.

In the development of the egg there occurs a process of polyembryony which, however, differs in detail from that reported by Marchal for *Encyrtus* and *Polygnotus*. One of the most striking features is that there are developed two very different types of larvæ. From a single egg there originate about a thousand normal larvæ of the form typical of endoparasitic hymenopterous larvæ. In addition to these, there are produced one hundred or more vermiform *asexual* larvæ. These lack any trace of circulatory, respiratory or genital systems, or of malpighian tubes. They are provided with strongly-developed mouth parts.

The sexual larvæ transform into pupæ when the host larva has completed its growth, and later, into adults. The asexual larvæ, on the other hand, degenerate completely, never giving rise to adults.

At first thought it might seem that these asexual larvæ are abortive forms, without special function. Considering, however, the development of their mandibles, and of the skeletal, muscular, and digestive systems, it appears to Silvestri natural to believe that, being able to penetrate readily the organs of the body of the host larva and having mandibles especially adapted for tearing, they have the function of breaking down the larval organs of *Plusia* in its last days and thus preparing them to serve as nutriment for the sexual forms. If this be true, we have in *Litomastix* a larval dimorphism comparable to the polymorphism of social insects. The parasitic life, the factor which has acted to push back to the very egg stage the multiplication of the species, has served to bring about the precocious development of caste.

A new species of the Orthopterous genus Daihinia.

By A. N. CAUDELL, Washington, D. C.

Daihinia phrixocnemoides n sp.

Female.—Resembles very closely members of the genus *Phrixocnemis,* but the three segmented first and third tarsi preclude its being placed in that genus.

Head moderately large and broad; occiput rounded, front broadly convex; eyes small, not prominent; palpi with the terminal segment about equal in length to the previous one and concave beneath on the apical third and somewhat swollen. Pronotum rounded above, about as long as broad; lateral lobes very broadly rounded below, descending about the same distance as the descending lobes of the meso- and metanotum. Abdomen rounded above; ovipositor long and moderately slender, three-fourths as long as the third femora and curved gently upwards, the lower valves armed apically with five large recurved teeth, four ventral and one terminal. Legs stout; first and intermediate femora armed below on the inner, or front, margin with a small pregenicular spine; third femora unarmed, one-third as broad as long, nearly straight below, above strongly arched, only the apical sixth subparallel: first tibiæ stout and apically swollen, convex outwardly, concave inwardly, armed above with one stout, blunt, down-curved calcarium, and below, on the outer side, armed with four stout, blunt calcaria and on the inner side with four sharp spines, the terminal one very long and with a minute spinule just above it; middle tibiæ not swollen, armed on the rounded lower side with two rows of very fine spines, three spines on each side; besides these spines there are two long terminal spurs on each side, one above and one below; third tibiæ rounded below and sulcate above, considerably deeper and some broader at the middle, below armed on the outer side a short distance from the apex with a single very minute inconspicuous spine and at the apex with a pair of short, stout, black-tipped calcaria; above armed on the outer margin on the basal two-thirds with a number of fine teeth and on the apical two-thirds with nine long calcaria, whitish basally, black apically, the two basal ones and the apical one shorter, being about one-half as long as the broadest depth of the tibia, the other six very long, the longest being fully as long as the greatest tibial depth; on the inner side the third tibiæ are armed on a little less than the basal two-thirds of the undulating margin with a number of short black-tipped teeth, similar to those of the outer margin, and armed with nine long heavy calcaria arranged about as those of the outer side, but the long calcaria much longer, the longest being decidedly longer than the greatest tibial depth. First and third tarsi tetramerous, the first and second segments short, the second little more than one half as long as the first and both together scarcely one half as long as the third; the two basal segments are produced ventrally as blunt, naked, black-tipped projections, the basal segment of the hind tarsus having a stout triangular tooth about the middle beneath; the third segment of both the first and third tarsi are cylindrical and the claws are very long, more than two-thirds as long as the apical tarsal segment and thick basally, apically tapering and infuscated The middle tarsi are pentamerous, the basal and apical segments subequal in length, the intermediate ones very small, the second closely united to the basal one, none ventrally produced as are those of the first and third tarsi. The claws of the middle tarsi are less elongate than those of the others

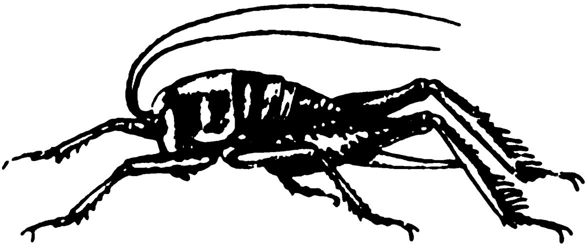


FIG. 1.

Color brown and light yellow, the first and intermediate legs, the lower half of the head, the ventral margin of the lateral lobes of the pronotum, the ovipositor and the margins of the abdominal segments being the latter color The inner face of the third tibiæ, the base of the calcaria and spines and the third tarsi as well as the antennæ, at least basally, and the body of the black tipped palpi are also light yellowish, and the face and outer disk of the third femora are mottled with it

Length, pronotum, 4 5 mm ; third femora, 12 mm ; third tibiæ, 9 mm.; ovipositor, 9 mm.; width third femora at widest point, 4 mm. 4 mm.

Type in U. S. Nat. Mus.

One female, Mesilla Park, New Mexico, August 12, 1898 (Cockerell).

This species is very distinct from *D. brevipes*. The latter is less variegated in color and the calcaria of the posterior tibiæ are not so conspicuously long. The claws of the new species are proportionately much longer than those of *brevipes*, and the third tibiæ are straight on the lower side instead of slightly curved as in *brevipes*. The third femora of *phrixocnemoides* are apically about one-third as broad as the basal portion, while in *brevipes* the apical width is more than one-half the basal width.

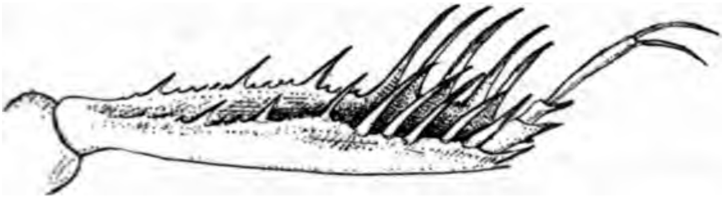


FIG. 1*a*.

Figure 1 shows the type specimen of *phrixocnemoides*, and figure 1a represents third leg much enlarged.

A new Mayfly of the genus Caenis.

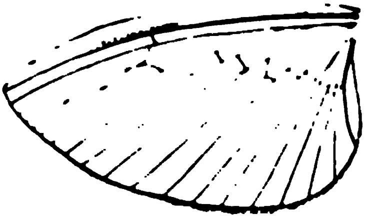
By NATHAN BANKS.

The genus *Caenis* is one of the most distinct in the Ephemeridæ. Its species, however, being small, are little known. Hagen recorded two species from the Eastern States, and recently Dr. Needham has described a third. I have a new species from the West, described below, and another form from Florida. Dr. Needham has figured the wings of the three species; however, I do not find that there is as much difference in the venation as would appear from his figures. He shows the wing of *C. hilaris* with fewer cross-veins than *C. diminuta*, and both without anal cross-veins, yet in all the specimens of this genus that I have seen, the anal cross-veins are present as well as all those shown for *C. diminuta*. The difference is in the distinctness of these veins, the anal, and sometimes some of the others, only can be seen when held against the light; moreover, there is variation in this distinctness, and in the position of these cross-veins, while additional cross-veins are sometimes present. In his figure of *C. allecta* Dr. Needham shows the last fork of the radial forks arising from the lower instead of the upper branch; this is not mentioned in the description, but is different from all specimens seen by me.

My new species differs chiefly by its broader wings, and I shall therefore call it

C. latipennis n. sp.

Thorax pale, shining brown, paler on sides; abdomen dull brown above, paler beneath; legs pale, tips of femora darker; setæ pale, faintly annulate with brown; wings whitish, the subcosta and radius very dark and prominent; the anterior cross-veins to median fairly distinct, those behind very faint. The marginal hairs of wing are very short near tip, but longer behind toward base. Tibia of male plainly more than twice as long as femur. Anal stylets long, and sharp-pointed as figured for *C. diminuta*.



Caenis latipennis.

Expanse 8 to 9 mm

Several specimens from Pullman, Washington, June.

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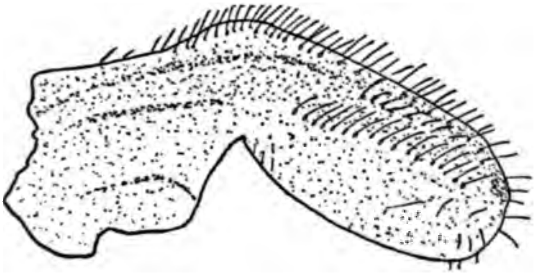
Mr. J. Chester Bradley, formerly of Philadelphia and Ithaca, is now Laboratory Assistant in Entomology at the University of California, at Berkely. Mr. Bradley is at present inspecting orange groves near Los Angeles and San Diego. We wish him great success in his new environment.

Notes on the Subapterous Female of Tipula simplex Doane.

R. W. DOANE, Stanford University.

Early in March, 1906, while collecting in a meadow near Stanford University, I found thousands of Tipulids half flying, half running over the grass. Many were collected, and all proved to be male specimens of *Tipula simplex* Doane. Although it is not uncommon to find the males of several species of *Tipula* issuing somewhat earlier than the females, the very great abundance and the peculiar actions of this species, running frantically over the grass, rarely flying and then not rising more than a few inches, caused me to make a particularly close search for the females, but none were found at the time. Two days later, in another place where the males were again abundant, a few females were found crawling slowly over the ground in the thick grass, sometimes crawling up on the grass. They were, as the action of the males had led me to expect, unable to fly. The wings were short and rudimentary, being about as long as the halteres, distorted in shape, entirely veinless and with rows of rather long, stiff hairs along the costal margin in the anterior distal portion. The accompanying figure will give some idea of the shape of the wings and the arrangement of the hairs. In other respects the female is similar to the male, except that the legs are much shorter and stouter. The ovipositor is reddish-brown, the upper valves rather wide at the base, tapering to a sharp point and curving slightly outward at the tip. The lower



Rudimentary wing of female *Tipula simplex* Doane.

valves are broader and blunter and do not reach the tip of the upper valves.

As the early part of March was stormy, but little collecting was done, and only eighteen females were taken. Two pairs were taken mating, and one female was seen with her ovipositor thrust into the ground, evidently depositing her eggs, but no eggs were found. A few pupæ, but no larvæ were found.

We have, of course, a number of apterous or subapterous forms throughout the Diptera, the two conditions being, indeed, found in the Tipulidæ. The genus *Chionea* being entirely wingless, and the species recently described by Coquillett, (Can. Ent., Vol. XXXVII, p. 347), assigned provisionally to the genus *Limnophila*, in which both the male and the female have abortive wings.

It is difficult to conceive what combination of forces or tendencies have been at work to bring about this particular anomalous condition. We can easily see why it would be advantageous for the parasitic forms living among the hairs or feathers of their host to be wingless. We also think we can see the advantage the wingless or short-winged forms have over the winged forms in regions where the latter are more or less apt to be carried to their destruction by the winds. Thus it is assumed that *Calycoptera moseleyi* Eaton and others on the Kerguelen Islands have gradually lost their wings through a process of natural selection, and we can conceive that the snow-loving *Chionea* and the subapterous alpine *Limnophila aspidoptera* possess an advantage over flying forms living under similar conditions. But none of these explanations have any force in the present instance. The fact that practically all of the Tipulids are winged and are able to fly considerable distances is certainly good evidence that the winged forms are well fitted to their environment. But here we have living under exactly the same conditions as to time, place, temperature, etc.; this wingless form, which, if numbers count for anything, is certainly a successful form. It seems that some explanation other than that of natural selection will have to be looked for if we are going to "explain" such cases.

Notes on Certain Cranberry-Bog Insects.

By H. J. FRANKLIN, B. S., Massachusetts Agricultural College,
Amherst, Mass.

During a five months' stay in the Cape Cod Cranberry region, from May 1st to the last days in September of the present year, I was engaged in studying the insects generally considered as being economically important in the cranberry industry. As was natural, I made a considerable number of observations on other species and a portion of these are presented in the following notes.

The larvæ of the Geometer *Cymatophora sulphurea* (Packard) were found in considerable numbers on several cranberry bogs located in the towns of Carver, Wareham and Falmouth early in June. They were so abundant and their manner of feeding was such that they had a marked effect on the crop of berries harvested on one bog. Before the bud at the tip of the upright shoots had been developed to form the new growth, these larvæ began their feeding, and the bud at this time being the most tender part of the plant it was the portion chosen almost exclusively by the caterpillar for its food. On the bog where these larvæ were found in greatest abundance the winter flowage was held late in the spring and the buds had not yet developed into the new growth to any considerable extent even early in June. The caterpillars were at this time feeding voraciously on these buds. Often the entire bud was devoured, but as a rule, only the central portion was eaten out, leaving an outside shell. The larva and pupa of this species have not heretofore been described.

Full-grown larva.—Length, 18 to 20 mm.—General color light green. Head normally rounded; lighter in color than the body and not as distinctly green; without mottlings or markings, with the exception of a narrow cream-colored stripe on each side extending horizontally from the base of the mandible to the hinder margin, where it merges into the lateral body stripe. Body somewhat larger toward the posterior end; finely striped the entire length, both above and below, with longitudinal whitish lines, those on the dorsum being much more distinct than those on the venter. Sides of body with a narrow cream-colored stripe running the entire length, just below the spiracles, from the head to the base of the anal proleg and joining anteriorly the stripe on the head already described. Surface of body bearing short sparsely scattered hairs (see Figs. 1 and 2). Spiracles small, chestnut brown. Anterior prolegs each bearing from seventeen to twenty crotchets which are subequal in length and arranged on a crescentic pad in a single row. Crotchets of each anal proleg numbering from twenty five to twenty eight and arranged in a crescentic row similar to that on the anterior prolegs. Venter lighter colored than dorsum and sides.

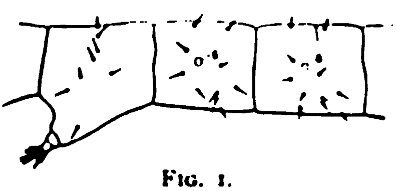


FIG. 1.

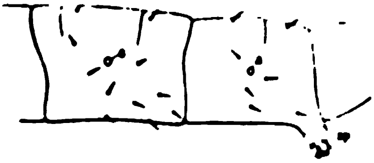


FIG. 2.

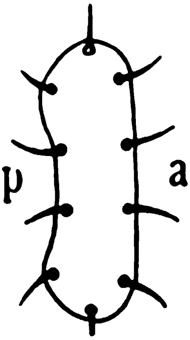


FIG. 3.

Fig. 1.—Arrangement of tubercles and hairs on the metathoracic and first two abdominal segments of the larva of *Cymatophora sulphurea* (Pk.), full grown. S. spiracles.

Fig. 2.—Arrangement of tubercles and hairs on some of the posterior abdominal segments. S., spiracles; a. p., anterior proleg.

Fig. 3.—Cervical shield showing arrangement of its tubercles and hairs.

Most of the larvæ found in early June pupated by the middle of the month. Pupation on the bog took place in the sand beneath the vines.

Pupa. Length, 8 to 10 mm. Greatest width, 2½ to 3 mm. General color dark chestnut brown to black. Abdominal segments strongly punctate. Cremaster straight and sharply conical, in some specimens more or less bifid at the tip, with straight, sharply pointed branches.

Cymatophora sulphurea (Packard) is at least two-brooded on Cape Cod. The adults of the first brood begin to emerge soon after the middle of June and continue to appear until into

July. This first brood continues on the wing until near the middle of this month. The second brood, which in all respects resembles the first, reaches the imago stage during late July and early August. The moths were found flying on every bog which I visited during their time of flight. The females and males of this species both vary somewhat in coloration. The males are always considerably the lighter, some specimens, even when they first emerge, having almost no yellow tinge at all in their coloring. All the females which I reared were on their first emergence strong sulphur-yellow in color. The dark spots usually so conspicuous in the female are in the male often very obscure.

During the month of July the larvæ of the Geometer *Tephroclystis miserulata* (Grote) were found eating holes into the unripe cranberries on a considerable number of bogs, and in some cases were quite abundant. They were also found in a few instances eating similar holes into the unopened buds of *Rhexia virginica* L.

During June, *Sphinx gordius* Cramer was found in small numbers on several bogs. Late in August and in September, its full-grown and nearly full-grown larvæ were also found feeding on the cranberry vines. This was the only *Sphinx* found on any of the bogs.

Epidemia epixanthe (Boisduval and LeConte) was found flying in great numbers on nearly every bog visited during late June and July. The larvæ were certainly not found on the cranberry vines, and it is still a question as to what the food plant of this species is. It seems to be a common bog insect over the entire Cape.

The larvæ of *Epagoge sulfureana* (Clemens) were found on cranberry vines in small numbers, feeding in a manner very similar to that of the larvæ of *Acleris minuta* (Robinson). After the larvæ became full-grown, they pupated in the spun-up tips as do the larvæ of *A. minuta.*

The larvæ of the Noctuid *Glaea sericea* Morr. were discovered during late May and June feeding at first on the buds at the summit of the old growth and later on the new growth which developed from them. These larvæ became full-grown and went into the earth to pupate during the last ten days in June and the first days in July. They reached the period of general pupation about the first of August, and the single moth which I reared emerged on October 6th.

Full-grown larva—Length, 20 mm.—General color of body light chocolate-brown. Head light yellowish brown and faintly mottled. Tip of mandibles black. A whitish stripe runs the entire length of the body from just back of the head to the anal proleg on each side, passing just below the spiracles and partially including some of them. Occiput of head and collar with an inconspicuous median longitudinal whitish line. A slight dark median shading runs the entire length of the body from just behind the collar. There are also two pairs of inconspicuous dark spots on the dorsum of each of the abdominal segments, the two spots of the posterior pair being placed farther apart than those of the anterior pair.

Pupa.—Length, 17 mm.—Color, light brown. Surface smooth, not punctate. Cremaster consisting of several (about four) straight sharp spines.

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NEW JERSEY is a place where any genus or species of insect may be found by those who have sufficient faith, and in addition to that it has a wonderful extinct animal. Mr. Rockefeller was very anxious to secure a specimen of the great *Hadrosaurus foulki*, fifty feet high, a specimen of which had been found in a marl pit. The Professor of Palæontology of the University of Chicago was sent out to secure a specimen. While crossing the dangerous pine barrens and in ascending a sand dune he severely sprained his ankle. Great was the consternation when he did not get back at the appointed time. The President of the University telegraphed to the Governor of Illinois, the latter communicated with the Governor of New Jersey, who 'phoned to New Brunswick and at once ordered the State Entomologist to send out a relief expedition. It arrived just in time. The learned Professor was on his back, nearly exhausted, with the left femur of a *Hadrosaurus*, five feet long, grasped in his right hand. Swinging this in the air he was beating off to save his life, clouds of *Coelodiazesis*, *Cyclolepidopteron*, *Lutzia*, *Ceratocystia*, *Pneumaculex*, *Panoplites*, *Deinocerites*, *Ochlerotatus*, [illegible], *Pseudoculex*, *Culiseta*, *Culicelsa*, *Melanoconium*, *Mochlostyrax*, *Sabethoides*, *Lesticocampa* and *Aldiborontiphoscophonium*.

A Jerseyman, a member of the rescuers, said the poor man nearly lost his life from a jolllotta of mosquitoes.*—*Newspaper*.

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*See *Canadian Entomologist* for Dec., 1906, p. 384.

On Phrynotettix magellanicus Bruner and Tristira bergi Brunner (Orthoptera).

By JAMES A. G. REHN.

In 1872, Glover, in his illustration of North American Entomology (Orth., pl. vi, fig. 25), applied the generic name *Phrynotettix* to the figure of a species of the genus later called *Haldmanella* by Saussure,* who apparently had never seen Glover's work. In a work published several years before the one containing *Haldmanella,* Saussure described a peculiar South American genus of locusts and applied the name *Phrynotettix* to it.† From this it will be seen that *Phrynotettix* must date from Glover and should be used in place of *Haldmanella,* which has already been done by the author,‡ *Phrynotettix* Saussure falling on account of preoccupation. The latter genus was described by Saussure as a member of the Oediopodinæ.

In 1900, Bruner described a species of *Phrynotettix* Saussure|| from the Straits of Magellan, and two months later, Brunner von Wattenwyl independently described the same species as a new genus and species of Truxalinæ—*Tristira bergi.*§

Eary in 1906, the author recorded specimens as the latter species, overlooking Bruner's species, as its proper relationship appeared to be with the Truxalinæ (Acridinæ).

A re-examination of the material sustains the opinion that closer relationship exists to the Acridinæ than to the Œdipodinæ, but the proper position of this as well as several other genera is debatable. From the evidence given above, it is obvious that *Tristira* must be used as the generic name and that *magellanicus* Bruner has priority over *bergi* Brunner, the correct combination being *Tristira magellanica.*

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*Addit. Prodr. Oedipod., pp. 123, 153. 1888.

†Prodr. Oedipod., pp. 47, 99. 1884.

‡Proc. Acad. Nat. Sci., Phila., 1902, p. 595.

||Acc. Gen. Spec. Locusts Agent., p. 44. Exact date according to Bruner (in litt.), Aug., 1900.

§Comunic. Museo Nac. Buenos Ayres, I No. 7, pp. 235-236. Oct. 9, 1900.

Rare Butterflies.

By Henry Skinner.

The following question has been asked :—Kindly state in the News what is considered the rarest butterfly in North America? That is a very difficult question to answer and may be evaded by asking What is a rare butterfly? or in other words, what is meant by the term rare. We will consider the question first from the standpoint of rare in collections. A butterfly may be very rare in collections but very common in nature. Butterflies may be rare in collections from the following reasons: They may live in localities remote from resident collectors; they may be found in places rarely visited by collectors on account of distance or inaccessibility; they may be scarce in nature and restricted to a comparatively small area. As a general rule they may be said to be abundant at the proper place, in a given year, in the appropriate season. There are certain names in our lists that represent species of more or less doubtful validity and are probably synonyms, and these make a class that may be called rare for obvious reasons, but need not be considered here. As a subclass under this heading may be considered aberrations that have been given names but seldom recur in nature.

A few species that are rare in collections may be considered. *Argynnis nokomis*, so far as I am aware, has not been taken for over twenty years. The late Berthold Neumoegen received a number from somewhere in the vicinity of Kanab in southern Utah, and supplied most of the collections in the early eighties. *Argynnis nitocris* was described in 1874. About seven years ago Prof. T. D. A. Cockerell found it in abundance. Prof. F. H. Snow has also taken some of recent years. This butterfly was scarce because it flies late in the season (after August 15th), and is only found, so far as known, at an elevation of about 7200 ft. *Argynnis atossa* is one of the rarest butterflies in collections. It has never been found outside of a certain place at a certain elevation in the Tehachapi Mountains in southern California. *Argynnis astarte* was described in 1848 and not refound until 1891. It is still rare in collections but is probably found over a large extent of country at certain altitudes. *Melitæa albiplaga* Aaron is only known from the unique type. It may prove to be an aberration of a common species. *Cystineura cana* has been found but once in the United States. One specimen of *Myscelia skinneri* has been found in New Mexico. *Junonia negra* Felder is only found in southern Arizona and is apparently rare there. A butterfly that is probably only in two collections in the United States is *Debis creola*. It is doubtless common in places on the Gulf coast of Louisiana and Texas. Another rarity in collections is *Neonympha mitcheli*, but it is common in certain parts of Michigan. *Cœnonympha kodiak* comes and goes in its northern home, but seldom finds its way into the cabinet. *Cœnonympha haydeni* was very rare until its headquarters were found in Idaho and the Yellowstone. This will be the history of most of them. *Erebia fasciata*, *rossi*, *vidleri* and *magdalena* all delight the eye of the collector as they are all rare in the cabinet, as people don't go every day to Mount Cheam and the other localities in the far north. *Satyrus pegala* comes from a section of the country where there is little interest in entomology and consequently is a very desirable fly. *Satyrus wheeleri* from Owen's Lake is a very rare species. *S. sthenele* is possibly the rarest in collections as it is probably extinct. *Chionobas peartiæ*, in honor of Mrs. Mary Peart, one of the greatest entomological artists that ever lived, is only known from type material as it was found in Victoria Land, British America. *Lemonias duryi* is almost unknown to the collectors. *Thecla wittfeldi* has not been found since the original catch in 1883. The vegetation on the spot where Dr. Wittfeld took it, on the Indian River, Florida, has been destroyed by cultivation. *Thecla ontario* is one of those doubtful things that I have never seen. Our Canadian friends should tell us what it is or is not. *Thecla acis* was a great desideratum until collectors became frequent visitors to South Florida. For a butterfly that has been found from Canada to Arizona, *Thecla læta* is very rare in collections and is also an excellent illustration of a butterfly found over an immense area and so far as known nowhere commonly. *Chrysophanus hermes* was probably only in two or three collections but is now being taken in some numbers, and its life history is likely to be published. A little butterfly rare in collections but common in parts of the West is *C. zeræ*. *Lycæna xerces*, supposed to be extinct, has come to life, but is very local. *Lycæna lotis* is a very rare butterfly if it is a valid species, as the writer never saw one. The locality is Mendocino, Calif. *L. aster* from Newfoundland is a great rarity in collections. *Lycæna striata* is also unknown to the writer of this article. *Neophasia terlooti* was described in 1869 and not again found until 1900. *Pieris ochsenheimeri* from Alaska is in two collections only. *Anthocharis pima* was unknown in collections for a number of years. Arizona and its fauna is becoming better known every year, although there are vast tracts and many mountain ranges yet to be explored. *Colias boothi* is probably very common in Boothia-Felix, but there is only one specimen of it in the United States. It is probably the rarest butterfly that is still living. *Colias behri* is a good illustration of a butterfly that is rare in collections on account of a limited geographical range. It is an alpine species found about the Yosemite Valley, California. The golden *Parnassius eversmanni* is a very great rarity in collections, but is beyond doubt very common in its native haunts. *Papilio nitra*, *indra*, *pergamus*, *brevicauda*, *pilumnus*, *cresphontinus* are all good ones and lucky the collector that has them all. *Ancyloxypha longleyi* was found near Chicago, Illinois, where there are numerous collectors, yet there is but one specimen known. There are certain names in the Hesperidæ that represent more or less doubtful species and we will only refer to rare valid species. The following are rare in collections: *lasus*, *cabelus*, *rhesus*, *carus*, *licinus*, *meskei*, *verus* (the latter is a variety of *nemorum*), *morrisoni*, *chusca*, *mardon*, *bellus*, *loammi*, *lunus*, *panoquinoides*, *errans*, *python*, *cestus*, *yehl*, *lagus*, *arogos*, *arabus*, *carolina*, *libya*, *outis*, *drusius*, *hesus*, *copaeui*, *streckeri*. To refer to the original question again. The rarest butterfly found in North America may be said to be a valid species, represented in a single collection, by one specimen, and it the most difficult species of which to obtain additional material. What is it? The rarest species in nature is the one confined to the least geographical area and producing the least number of individuals. What is it?

ENTOMOLOGICAL NEWS.

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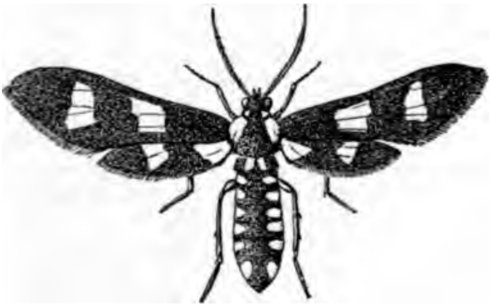
PHILADELPHIA, PA., JANUARY, 1907.

For several years it has been our custom to figure the most interesting or remarkable insect described during the year and illustrate it on the cover of the January NEWS. We have asked for suggestions in regard to this matter, but for the year just closed we have had none. The species figured here is probably not by any means the most remarkable but it was available and so here it is. Prof. F. H. Snow discovered the species in the Baboquivari Mountains in Arizona. It was described in this journal on page 379, Dec., 1906.



Syntomeida befana Skinner.

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The great necessity for economy of time and energy in routine work in entomology is painfully apparent. This is the age of insects and many of us fully recognize the great value of the study. The subject is such a vast one and the workers so comparatively few, that the necessity for modern aids of various kinds is very great. Fortunate are those who can escape various kinds of drudgery. What would the business man of to-day think if he were obliged to do without a stenographer, typewriter, filing cases and other things of like character? Many entomologists could turn out more and better work if they were so situated as to command these necessities. Almost no financial aid comes to entomology as compared with other researches of natural science, and yet we firmly believe that there is not one that exceeds it in importance. We sincerely trust that this condition will not continue. It is very gratifying to see that in far-off Africa, the ice in this respect is being broken. We refer to the splendid second report of the Wellcome Research Laboratories at the Gordon Memorial College in Khartoum.

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Entomological Literature.

OBSERVATIONS ON THE STAPHYLINID GROUPS ALEOCHARINAE AND XANTHOLINI, CHIEFLY OF AMERICA.—By Thos. L. Casey. Transactions of the Academy of Science of St Louis. Vol 16, No. 6 Issued November 22, 1906.

This work of 300 pages is devoted to a study of groups of small Coleoptera which have been much neglected The author says: In the Aleocharinæ, the parts of the series selected for present review are those which are of more general interest and therefore somewhat systematically collected, although this is only true in a relative sense, there being many most interesting genera and species still to be discovered Besides these groups of the Aleocharinæ, a revision of the tribe Xantholini is presented, based upon such material as could be conveniently brought together Many new genera and species are described The author is to be congratulated on presenting to entomology such a valuable contribution to the literature of the subject, and it is to be hoped that it will stimulate a greater interest in a rather neglected family of the beetles

* * *

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

It has been found that there are 900,000 separate kinds of bugs in Missouri It would appear from complaints in the Boston papers that there are only two kinds in Massachusetts—the gypsy and brown-tailed moths. *Newspaper.*

PROF H A PILSBRY of the Academy of Natural Sciences of Philadelphia has just returned from Arizona. He collected a number of insects most of which were taken in the Chiracahua Mountains.

St. Louis, Sept. 26th.—Myriads of butterflies, all moving by flock in a general southerly direction over the city, sometimes circling, attracted much attention this afternoon, particularly in the business streets.

Little groups of people craned their necks and shaded their eyes against the sun while they stared at the unusual spectacle. The butterflies were very large, some measuring about three inches from tip to tip of their wings, and were of a light brownish color.

The main body of the flock flew high in the air, well above the roofs of the tall buildings.

There is nothing that Dr. F. H. Snow brought back from his recent collecting expedition in Southern Arizona that he prizes more highly than the Gila monster, which he captured shortly before his return to Lawrence, which gained considerable notoriety by biting him on the thumb. The last five weeks since the return of the expedition the monster has spent in a cage in Dr. Snow's back yard and seems to like its new Kansas home fully as well as its former habitat in the southern hills of Arizona. It has not been sick a single day of its captivity and takes its meals of raw eggs every three days as regularly as clock work,

Gila, as Dr. Snow calls the creature for short, is a large lizard, being a little more than a foot long and has a head nearly two inches wide. Its mouth is amazingly large and is entirely out of proportion to the rest of the body. Its body is yellow and dark brown and at a short distance looks like Indian bead work.

Hour after hour Gila will lie in its cage without moving and appears as if it were dead, but stir it up with a stick or let it get angry and it will crawl around at a wonderfully fast pace. It is gentle and will never bite unless it is tormented or angry. Once let it get angry and it will seize the end of a stick or anything thrust at it and hold on for dear life.

To watch it eat is an interesting sight. In nature the Gila monster lives on insects, but thus far in captivity it appears to be thriving on raw eggs. After a little experimenting Dr. Snow has found that every three days is the right time to feed the creature. When the time for feeding arrives he grabs the lizard by the neck and lays it out on a table or flat box. He then cracks an egg in a saucer and thrusts the creature's nose down in it and the Gila does the rest. It stretches out its long tongue into the saucer and greedily laps up raw egg until it has a mouthful. Then it slowly raises its head to a vertical position and lets the egg run down its throat. After it has once started eating, Gila needs no urging, but laps away greedily until its hunger is satisfied. The last time Dr. Snow fed the animal it finished two raw eggs.

It would hardly be correct to call Gila a family pet, for all the members of Dr. Snow's family are afraid of it except Dr. Snow. As far as he is concerned, however, he handles it about fearlessly in spite of the fact that it has bitten him once. He took it in the house the other day and, being called out of the room, placed it in a waste paper basket for safe keeping, putting a sofa pillow on top of the basket to keep it from escaping. Before Dr. Snow returned Gila had decided to explore a little, and, crawling up the side of the basket, pushed off the sofa pillow and made its escape. Nothing more was seen of it for several hours, when the family, not wanting to have a live Gila monster roaming around the house any longer, began a determined search for it and finally found it snugly hid behind some books in the bookcase.

The question of whether the Gila monster bite is very serious or not is a much disputed one, but Dr. Snow believes it is not.

"The effects of a Gila monster bite have been much exaggerated," said Dr. Snow in discussing Gila monsters, and his own pet in particular. "Of course I have not had so very much experience with them, but so far as I could judge I should not call it very dangerous The one I have in my back yard planted six teeth securely in my thumb, and I suffered no ill effects from it other than from the mere pain of the bite. The prompt application of an antidote which I had on hand, however, may have had something to do with my escape from sickness. A ranchman near where I was bitten seemed much concerned over the accident and told several instances of people having to spend weeks in a hospital as a result of a Gila monster bite."

Doings of Societies.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 24, 1906, Mr. Philip Laurent, Director, presiding. Ten persons present.

Mr. Ilg exhibited specimens of *Anthocharis genutia*, showing variation in size.

Mr. H. L. Viereck said he was preparing a work on the Hymenoptera of Connecticut, with an introduction, containing tables for the separation of families, genera and species, with notes on the latter. He thought the work would number not less than five hundred pages.

Mr. Coxey exhibited a collecting paper for insects, on which was printed blank forms for entering data.

Mr. Viereck advocated a study of the relation between the weight of insects and their wing expanse, for furthering a knowledge of aerial navigation. Mr. Wenzel said insects usually fly against the wind and their navigation is the reverse of that of a balloon.

Mr. Matthews exhibited specimens of *Periplaneta americana*, and related his experience in trapping them. He showed winged and wingless forms.

HENRY SKINNER, *Secretary*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held September 27, 1906, Dr. D. M. Castle presiding. Thirteen persons were present.

Dr. Skinner exhibited a bred ♂ of *Platysamia gloveri* from the Huachuca Mountains, Arizona, and spoke of the differences between its larva and that of *cecropia*. He also exhibited *Hepialus thule*, a rare species found at Montreal, Canada.

Mr. Daecke said he had located some pitcher plants at Toms River, New Jersey, and determined to examine them this season for *Papaipema appassionata*. He found the workings on September 22d, and exhibited them, but was too late in the season to get imagos. He also called attention to a method of making double mounts and exhibited the process. Number 00 black pins are put through the insect in the ordinary way; the pin is bent at a right angle under the insect and then pinned into a small piece of polyporus fungus which is on the larger pin. The excess of the small pin is removed with cutting pliers.

Mr. Viereck said during the summer he had been delegated by Dr. Samuel G. Dixon, Commissioner of Health, to make a mosquito survey of Pennsylvania. He had one assistant, Mr. J. Irwin Zerbe. The principal object in view was to combat malaria, and all the principal cities were examined. Attention was also given to a typical Canadian zone town in Sullivan County, and especial attention was given to the valley of the Susquehanna, as all evidence seemed to point to this being the strategic river valley in the crusade against malaria in the State. *Culex pipiens* was found breeding by the billion where no *Anopheles* could be found, but in this case the water was adulterated from refuse discharged by a glue factory. This is possibly the reason for the paradox here. In the acid waters and the oily waters of the coal and oil regions, respectively, no mosquitoes of any kind were found, nor were mosquitoes found breeding in certain cities where every depression had been filled in with material in the course of city development. The breeding of mosquitoes was always found greatest where interference with nature's balance by man was most marked. *Anopheles punctipennis* always greatly outnumbered *A. maculipennis.* It seemed quite evident during the course of the visits, that there was no demand for talks on the subject of mosquitoes as there was in the summer of 1903. This indicated to them that there had been a decline in the enthusiasm over the subject.

Seemingly unpardonable ignorance of basic facts and principles in entomology was detected, even among physicians, and in general it was noted that the dubbing of everything that crawls with the term "bug," is still too widespread. It seemed to them that this is due to the fact that entomologists seem loath to translate their study to the public through collections and articles. Hence they are impelled to wish that entomologists may become more concerned in giving their study the place it deserves in the public estimation, and in dispelling, among other things, the allusion to an insect as a despised bug.

HENRY SKINNER, *Recorder.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held November 22, 1906. Dr. D. M. Castle presided. Thirteen persons were present.

Mr. Ilg presented eighteen specimens of blown larvæ.

Mr. Rehn reported the gift of eighty-nine species of Orthoptera, by Mr. Biolley, from Costa Rica.

Dr. Calvert described his trip to Mexico during the past summer. He visited Hermosillo and Nogales in Sonora; Guzman, Chihuahua City and Santa Rosalia in Chihuahua; Torreon, San Pedro and Saltillo in Coahuila; Zacatecas, Aguascalientes, Queretaro, Lake Chapala, Guadalajara, Mexico City, Orizaba, Jalapa, Popocatepetl Park and Toluca. The collecting at these various places was described. No new species of Odonata were found. One species new to Mexico was taken, *Libellula flavida* Hagen not Ramb.

Mr. Rehn exhibited some remarkable forms of Orthoptera purchased by Mr. Hebard.

Mr. Viereck made a communication on the parasites of man and spoke especially of insects as factors in the transmission of disease. The fact that under certain conditions insects change their hosts was mentioned.

Mr. Daecke said in regard to a previous communication he had made an error. At Weymouth, N. J., he had found Yucca. He showed the stems from which he had raised a number of moths which he thought were *Pronuba yuccasella,* but on further investigation they proved to be *Prodoxus intermedius.* *Pronuba yuccasella* only breeds in the capsules or seed pods. The pupa cases of the two show remarkable differences. The *Yuccasella* pupates on the ground; the larvæ of *intermedius* do not leave the plant.

Dr. Skinner exhibited a picture of the larva of *Crinodes biedermani* made by Mr. Weigand.

HENRY SKINNER, *Recorder.*

A meeting of the American Entomological Society was held June 28, 1906, Dr. P. P. Calvert, President, in the Chair, and ten persons present.

Mr. C. Few Seiss presented a piece of ebony perforated by the so-called ship-worm (*Teredo*), which was turned over to the Conchological Department of the Academy of Natural Sciences.

Mr. J. A. G. Rehn said he had received some interesting Orthoptera from Prof. C. F. Baker, taken on Mt. Tyndall, in California. A *Bradynotes* and a *Hippiscus* were of especial interest. The *Hippiscus* represented a small species compared to those taken at lower elevations where much larger species in the same genus occur. Also a katydid taken by C. R. Biederman at Florence, Arizona.

Mr. E. Daecke reported the capture of *Cordulegaster maculatus,* at Lacey, New Jersey, on May 27th, this being the second specimen recorded from the State. On June 24th, at Browns Mills Junction, he took *Hagenius brevistylus* while it was in the act of capturing *Dorocordulia lepida. Chrysophanus epixanthe,* June 17th, and *Gastropacha americana* on April 29th, were recorded from the same locality. On June 3d, at Dacosta, N. J., he captured *Tetyra bipunctata*, a hemipterous insect, representing a family new to the State.

Dr. Calvert said in his work on the Biologia Centrali-Americana, he was particularly interested in the study of widely distributed species and mentioned the coast form *Erythrodiplax berenice*, which is found from New Jersey southward to Panama. Going from north to south, the veining of the wing in this species becomes less dense. The same speaker also made remarks on the transition or intergradation of butterflies and beetles, as they are distributed from north to south.

Dr. Skinner exhibited *Xylophanes falco*, a sphynx moth from the Huachuca Mountains, Arizona, and new to the United States. It was captured by C. R. Biederman.

HENRY SKINNER, *Secretary*.

A meeting of the American Entomological Society was held October 25, 1906, Dr. Calvert, President, in the Chair. Nine persons were present.

Mr. Ilg presented twelve blown larvæ to the collection. He also exhibited specimens of *Utethesia bella*, showing variation, and among them two specimens of *U. ornatrix*, all found at Philadelphia. He was inclined to believe that *bella* and *ornatrix* were not different species.

Dr. Calvert said five specimens of *Tenodera sinensis* were seen in Woodland cemetery, West Philadelphia, during the second week of October, which had probably been introduced from the adjoining grounds of the Botanical Garden of the University of Pennsylvania.

He also said the *Argia translata* ♂ taken at Roxborough, Philadelphia, by Mr. Haimbach in 1905 was the first record for Pennsylvania. The same gentleman took two female specimens in the same locality this year. It was described from Venezuela

Dr. Calvert captured *Chrysina macropus* under the electric lights in Jalapa, Mexico. He also saw the species flying during the day.

HENRY SKINNER, *Secretary*.

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AND

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Itinerary of Mr. G. C. Champion's Travels in Central America, 1879-1883.

BY G. C. CHAMPION.

The following itinerary of my travels in Central America (Guatemala and Panama), March 16, 1879-May 21, 1883, has been drawn up at the request of Dr. P. P. Calvert, of Philadelphia, for publication in ENTOMOLOGICAL NEWS.

It may, perhaps, be of interest to American, as well as to European, entomologists or to future travelers, pending the possible publication in the "Biologia" of a fuller description of the many places visited. In Guatemala both the Atlantic and Pacific slopes were investigated, as well as the central plateau, the larger volcanos, &c., the Atlantic slope proving to have an incomparably richer insect-fauna than the Pacific. In Panama (Chiriqui) the Pacific slope only was investigated, the Atlantic side being very inaccessible and having no villages or centres of population except along the coast or around the Laguna de Chiriqui. The journey to Central America was made to obtain material for the Biologia Centrali-Americana and under instructions from Messrs. Godman and Salvin.

1879. March 16-18. San José de Guatemala.* Sea coast, mangrove swamps, lagoons, etc.

March 19, 20. Traveling up to capital.

March 21-April 2. Guatemala city (about 4500 ft.). Open plains, intersected by deep barrancas (ravines). Scrubby oak and pine woods in places on hillsides.

April 3-5. Ciudad Vieja. The first capital of Guatemala, in the valley between the volcanos Agua and Fuego. Coffee plantations and cultivated ground.

April 6-8. Guatemala city.

April 9. Aceituno. Plantation near the capital.

April 10-16. Guatemala city.

April 17-May 12. Capetillo. Valley between the volcanos Agua and Fuego. Coffee and sugar cane plantations, with the forest-clad slopes of the Fuego adjacent.

May 13-June 22. Zapote (about 2000 ft.). On the forest-clad southern slope of the Volcan de Fuego.

June 24, 25. Antigua.

June 26-July 21. Dueñas (about 4500 ft.). Near Capetillo. Coffee and opuntia plantations adjacent to the Lake of Dueñas. Various excursions made from here to Calderas, on the upper eastern slope of the Volcan de Fuego, up to about 7500 ft. Pines on the higher ground.

July 22-Aug. 7. Guatemala city.

Aug. 8. Carrizal. Arid district with scrubby woods.

Aug. 9. Llano Grande (about 2000 ft.). Scrubby woods and cultivated ground.

Aug. 10-Sept. 9. San Geronimo, Baja Vera Paz (about 2950 ft.). East end of plain of Salama. Hot, dry region, with many cacti. Chuacus range of mountains adjacent. Lower slopes of latter clothed with pine forest, with forest of deciduous trees above

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[* The interested reader can easily follow Mr. Champion's itinerary on the map of Guatemala issued by the Bureau of American Republics, Washington, [illegible]. Scale [illegible] miles to an inch. Some account of his experiences, methods, etc., but not accompanied by any itinerary, was published in the Entomologist's Monthly Magazine for 189[illegible] under the title "Tropical Collecting."—Ed.]

Sugar cane and coffee plantations near village. Drainage to Atlantic. Headquarters for about one year. Many long excursions made from here to places on Atlantic slope.

Sept. 10. Santa Barbara (about 4450 ft.). Mountainous region of Chilasco, east of San Gerónimo. Scattered woods of Liquidambar, etc.

Sept. 11, 12. Santa Cruz (5500 ft.). Mountainous region of Chilasco, east of San Gerónimo. Scattered woods of Liquidambar, etc.

Sept. 13-Oct. 1. San Gerónimo.

Oct. 2-5. Purula (about 4000 ft.). Open ground with a humid virgin forest adjacent on mountains.

Oct. 6, 7. Sabo (2900 ft.). Clearing in dense humid forest.

Oct. 8-15. Panimá (1800 ft.). Hot, narrow valley of the Rio Sinanja, a tributary of the Polochic. Valley followed down to near Ribaco and upward towards Matanza.

Oct. 16. Purula.

Oct. 17. Cachil. Open arid mountain slopes, with agaves, palms, etc.

Oct. 18-Nov. 3. San Gerónimo.

Nov. 4-6. Tocoy (about 2000 ft.). Arid district on Zacapa road.

Nov. 7. El Jicaro. Village on eastern slope of Chuacus range. Scrubby woods, pines above.

Nov. 8-12. San Gerónimo.

Nov. 13, 14. Purula.

Nov. 15. San Miguel Tucuru (about 1500 ft.). Polochic valley. Mostly cultivated ground, cotton, maize, etc.

Nov. 16. La Tinta. Polochic valley. Tropical vegetation. Indigo formerly cultivated here, hence the name.

Nov. 17-23. Senahu (2800 ft.). Limestone mountains north of Polochic valley. Humid forests, cleared in places for coffee plantations. Long rainy season.

Nov. 24-30. San Juan (1800 ft.). Mountain slopes north of Polochic. Forest cleared for coffee plantations.

Dec. 1, 2. La Tinta.

Dec. 3-7. Tamahu, a few miles higher up the valley than Tucuru (about 2250 ft.). Mostly cultivated ground.

Dec. 8. Santa Rosa (about 4000 ft.).

Dec. 9-28. San Gerónimo.

Dec. 29. Tactic (4300 ft.). Scattered Liquidambar and and other trees. Forest all cleared to near mountain tops.

1880. Dec. 30-Jan. 2. Coban, Alta Vera Paz (about 3800 ft.). Humid region, rainy season sometimes continuing into February. Forest nearly all cleared to plant coffee, maize, etc.

Jan. 3. Tactic.

Jan. 4-6. San Gerónimo.

Jan. 7. Buenaventura.

Jan. 8-12. Guatemala city.

Jan. 13. Lake of Amatitlan (about 3450 ft.).

Jan. 14-18. Guatemala city.

Jan. 19. Buenaventura.

Jan. 20-25. San Gerónimo.

Jan. 26. Santa Rosa.

Jan. 27-Feb. 1. San Joaquin, Alta Vera Paz (about 3200 ft.). Pine-clad, arid mountain slopes. Rio Chisoy below. About the northern limit of the arid region of the central plateau.

Feb. 2. San Cristobal (4250 feet). Cultivated ground adjacent to the Lake of San Cristobal.

Feb. 3-5. Balheu (Valeu) (3850 ft.). Pine clad mountain slopes.

Feb. 6-10. Coban.

Feb. 11. Chiacam (2400 ft.). Coffee plantations and scrubby woods.

Feb. 12. San Agustin Lanquin (1000 ft.). Limestone formation. Second growth woods; forest all cleared.

Rio Cahabon, a large tributary of the Polochic, adjacent.

Feb. 13-23. Cahabon (800 ft.). Second growth woods, forest all cleared near village. Large Indian population.

Feb. 24-28. Lanquin. The large limestone cave visited. The Rio Cahabon, a broad stream, issues from its mouth.

Feb. 29-March 6. Chiacam.

March 7-9. Coban.

March 10-20. Cubilguitz (1050 ft.). Limestone region, with humid forest on hills. Broad valleys with scattered trees. The Rio Dolores reached, but not crossed. On main road from Coban to Peten.

March 21. Satchicha (2000 ft.)

March 22-24. Coban.

March 25. Tactic.

March 26-April 13. San Gerónimo.

April 14-23. Purula.

April 24-28. Panima.

April 29-May 2. Sabo.

May 3. San Miguel Tucuru.

May 4-12. Chacoj, near Chamiquin, sometimes called La Hamaca (from the old rope bridge over the Polochic) (about 500 ft.). Tropical forest with many palms.

May 13-18. Teleman, on the Rio Polochic. Fine tropical forests swarming with Culicidæ. Unhealthy district.

May 19-22. Panzos, on the Rio Polochic. Fine tropical forests swarming with Culicidæ. Willows on river bank. Unhealthy district.

May 23. Danta, on northern shore of the Lake of Yzabal.

May 24. Traveling up river Polochic.

May 25-June 2. Panzos.

June 3-14. Senahu, traveling up from Panzos by way of Trece Aguas.

June 15-21. San Juan.

June 22, 23. Chacoj.

June 24. San Miguel Tucuru.

June 25-27. Purula.

June 28-July 26. San Gerónimo.

July 27. Rabinal (2850 ft.). Dry region, with scrubby woods, cacti, etc.

July 28. Cubulco (2000 ft.).

July 29. Joyabaj (4300 ft.). Open mountainous region, intersected by deep barrancas. Pines and oaks on slopes. Central plateau becoming higher westward.

July 30. Santo Tomas Chiché (6100 ft.). Los Altos region.

July 31-Aug. 5. Chimente, Quiché mountains (7600 ft.). Oaks, pine, alder, etc., on slopes. Potatoes and maize cultivated.

Aug. 6. Totonicapam (7000 ft.). Pine-clad slopes.

Aug. 7. Chevuc (9000 ft.). Pine woods.

Aug. 8. Los Encuentros (8400 ft.).

Aug. 9, 10. Desconsuelo (Solchicha) (about 10,500 ft.). Pine forests. Very bleak situation. Carriage road from Guatemala city to Quezaltenango passes this place following the summit of the highest portion of the Cordillera. Potatoes only cultivated at this elevation.

Aug. 11-15. Pachoc (9200 ft.). Pine woods.

Aug. 16. Totonicapam.

Aug. 17-19. Quezaltenango (7600 ft.). Cultivated ground mostly.

Aug. 20-Sept. 9. Finca of Las Nubes, on the Pacific slope of the Cerro Zunil, above Mazatenango (4050 ft.). Coffee plantations, with dense forest above.

Sept. 10-23. San Isidro (1600 ft.). Pacific slope. Second growth woods, cleared in places for coffee and cacao plantations.

Sept. 24. Retalhuleu (950 ft.). Pacific slope. Second growth woods.

Sept. 25-Oct. 7. Las Mercedes (3200 ft.). Pacific slope.

Immense coffee plantations in this Costa Cuca district. Nearly all the original forest cleared.

Oct. 8-17. El Reposo (800 ft.). Low country near Pacific. Mostly second growth, but some forest in vicinity.

Oct. 18, 19. Paraiso (300 ft.). Near Pacific. Scrubby woods, bamboos, etc.

Oct. 20-22. Champerico. Sea coast.

Oct. 23. El Reposo.

Oct. 24-26. Las Mercedes.

Oct. 27-28. Coatepeque (1250 ft.). Mostly cultivated ground.

Oct. 29. Rio Naranjo (450 ft.). Second growth woods. Mexican frontier adjacent.

Oct. 30-Nov. 3. Finca La Union (2250 ft.). El Tumbador district, department of San Marcos. Coffee plantations and second growth woods.

Nov. 4-7. Finca La Carolina (2600 ft.). Tumbador district, overlooking Mexican coast.

Nov. 8. La Union.

Nov. 9. Rio Naranjo.

Nov. 10. Coatepeque.

Nov. 11-14. Las Mercedes.

Nov. 15. San Martin, near Ostuncalco (7400 ft.). Scattered trees, ground mostly cultivated.

Nov. 16-18. Quezaltenango. Cerro Quemado visited.

Nov. 19-Dec. 14. Las Nubes (Cerro Zunil).

Dec. 15. San Isidro.

Dec. 16-26. San Agustin (2250 ft.). Pacific slope of the Volcan de Atitlan. Second growth woods, coffee plantations, etc.

Dec. 27-29. San Lucas Toliman (4900 ft.). Oak woods, etc., around the lake of Atitlan. Pampojilaj visited and lake crossed to northern side.

Dec. 30. Panajachel (4900 ft.). Similar ground.

Dec. 31. San Lucas Toliman.

1881. Jan. 1. Godines (6900 ft.). Arid district above the precipitous slopes of the Volcan de Atitlan.

Jan. 2. Chimaltenango (5650 ft.). District cultivated with cereals.

Jan. 3-11. Guatemala city.

Jan. 12. Antigua.

Jan. 13. Volcan de Agua (about 13,000 ft.) ascended. Scattered pines to near summit, deciduous trees up to about 9000 ft.

Jan. 14. Antigua.

Jan. 15-Feb. 3. Pantaleon (1700 ft.). Pacific slope. Sugar-cane fields and second growth (rastrojo).

Feb. 4-14. Mirandilla (1700 ft.). Similar ground.

Feb. 15. Escuintla.

Feb. 16-18. Torola (1000 ft). Scattered patches of forest.

Feb. 19-28. Paso Antonio (400 ft.). Open savanas, with scattered crescentia and other trees, near Pacific. Lagoons here adjacent to the Rio Michotoya drained and used for pasturing in dry season.

March 1-3. Torola.

March 4. Savana Grande, near the Rio Maria Linda (about 1150 ft.). Scrubby woods and cultivated ground.

March 5. La Gavita (La Gavia) (1700 ft.). Similar ground.

March 6, 7. Brito.

March 8-16. Torola. District swarming with ticks in dry season.

March 17-April 3. Guatemala city.

April 4, 5. Escuintla.

April 6, 7. San José de Guatemala. Left by steamer on 7th en route for Panama.

April 9. La Union, Salvador. Landed for a few hours.

April 10. Corinto, Nicaragua. Landed for a few hours.

April 12. Punta Arenas, Costa Rica. Landed for a few hours.

April 17-20. Panama city. Left on 20th by steamer for Chiriqui.

April 22-30. David. Principal town of Chiriqui. Open savanas, with scattered, leathery-leaved, deciduous trees. Denser growth by river side and on hills adjacent.

May 1-27. Finca Nance Bonito (about 2800 ft.). Southern slope of Volcan de Chiriqui. Plenty of forest, cleared in places for coffee plantations, a fine palm locally abundant. Savana region ascending to about 2000 ft. Coniferæ altogether wanting in the district, probably not reaching south of Nicaragua.

May 28-June 25. Las Potrerillas (El Banco). Similar ground. Not far from Nance Bonito.

June 26-July 13. David.

July 14-Aug. 1. Finca La Elvira. Similar to Nance Bonito.

Aug. 2-8. Las Potrerillas.

Aug. 9-11 Boquete (3550 ft.). Southeastern slope of Volcan de Chiriqui.

Aug. 12-20. La Caldera (1500 ft.). Savana region, with scattered trees. On road from David to Atlantic coast.

Aug. 21-Sept. 27. Las Potrerillas.

Sept. 28-Oct. 20. David.

Oct. 21-Nov. 28. Bugaba (1000 ft.). Fine forests here, extending into Costa Rica; eastward and southward savanas, with scattered trees. Rio Ascaria and Rio Chiriqui Viejo descending through forest country. Sugar cane and coffee cultivated.

Nov. 29. Jugales (2500 ft.).

Nov. 30-Dec. 10. Potrero del Volcan (4000 ft.). Savanas ascending up to 6000 ft. to the precipitous western slope of the Volcan de Chiriqui (11,000 ft.). Dense forests westward and southward. Lagoons in forest, through which passes the Rio Chiriqui Viejo. Uninhabited district, in which large numbers of cattle are pastured.

Dec. 11, 12. Bugaba.

Dec. 13-26. David.

1882. Dec. 27-Feb. 2. Bugaba.

Feb. 3-5. Camaron (1750 ft.). Milpas (maize fields) in forest clearings, on Costa Rican road.

Feb. 6-March 15. Bugaba.

March 16-21. Las Potrerillas.

March 22-April 10. Bugaba.

April 11-13. David.

April 14-18. Bugaba.

April 19-29. Potrero del Volcan.

April 30-May 29. Bugaba.

May 30-June 5. Las Potrerillas.

June 6-8. Slope of the Volcan de Chiriqui (5500 ft.). Staying in hut erected by orchid-collectors in dense forest. Ascended to 8000 ft., by tracks made by tapirs through the dense undergrowth of bamboo to summit of ridge. Further progress stopped by an immense ravine, beyond which the upper part of the volcano could be seen. No water could be found near hut, and a longer stay therefore not possible.

June 9-12. Las Potrerillas.

June 13, 14. Finca Nance Bonito.

June 15-July 3. Bugaba.

July 4. Jugales.

July 5-7. Potrero del Volcan.

July 18-Aug. 15. Bugaba.

Aug. 16-19. David.

Aug. 20-28. Bugaba.

Aug. 29-30. Divala (Vivala) (350 ft.). Savanas, with the Rio Chiriqui Viejo adjacent. Fine tropical forest, with many palms, westward. A road into Costa Rica passes this place, not many miles from the Pacific. Eastward, on the savana, is the old capital of the district, Alanje

Aug. 31. Mosque (700 ft.).

Sept. 1-Nov. 30. Bugaba.

Dec. 1-3. David.

Dec. 4-27. Bugaba.

Dec. 28-30. David.

Dec. 31. Chorcha (300 ft.). Dense forest, descending down to coast, interrupting the continuity of the large savanas bordering the Pacific.

1883. Jan. 1. San Lorenzo (200 ft.). Savanas, with woods here and there.

Jan. 2, 3. Los Remedios. Similar country near coast.

Jan. 4-10. Tolé (1150 ft.). Similar country. Excursions made from here to various places on slopes of Cordillera.

Jan. 11. Cerro Algodon (2000 ft.).

Jan. 12-17. Peña Blanca (3000 ft.). Very broken open country in vicinity of the Peña (Bluff). Slopes above covered with forest. Ascended to 5500 ft. Indians from distant places on Atlantic slope assemble in Cordillera near here annually.

Jan. 18. Cerro Algodon.

Jan. 19-22. Tolé.

Jan. 23-28. Nancito (800 ft.)

Jan. 29. Los Remedios.

Jan. 30-Feb. 3. San Feliz (650 ft.). Savanas, with patches of wood. Village near the borders of the department of Veraguas, and not very far distant from the chief town, Santiago.

Feb. 4. 5. La Isleta. Adjacent to the Rio Fonseca.

Feb. 6, 7. Caña Fistula (650 ft.). Near the Montaña de Chorcha.

Feb. 8-10. David.

Feb. 11-March 3. Bugaba.

March 4-9. David.

March 10, 11. Bugaba.

March 12, 13. David.

March 14. Boquita. On way down to coast.

March 15-17. Boca Chica. Near coast.

March 18-24. En route to Panama in small coasting vessel.

March 25, 26. Panama.

March 27. Colon (Aspinwall).

March 28-April 2. Panama.

April 3-27. San Miguel, King Island (Isla del Rey), Pearl Islands. Scrubby woods much cleared in places to plant yams, etc. Coast fringed with mangroves and coco palms. Darien coast visible from San Miguel.

April 28, 29. On way back to Panama in small boat.

April 30. Panama.

May 1-17. Taboga Island, bay of Panama. Rocky ground ascending to about 800 feet with small streams.

May 18-21. Panama.

Elevations approximate only, taken from an uncorrected aneroid barometer. Probably too low in many cases.

Two new Species of Crambus and a new variety of Haematopsis grataria Fabricius.

By Frank Haimbach, Philadelphia, Pa.

C. placidellus n. sp.

Expanse of wings, 16 mm. Head and thorax above, white. Palpi whitish ochreous, pale cinereous on the outside. Fore wings ochroleucus, whitish towards the base, sprinkled with dark brown atoms between the base and subterminal line, these atoms being most numerous between the median and subterminal lines; a light brown median line, starting from the middle of the costa, bent outwardly and running to beyond the middle of the hind margin; the subterminal line is whitish, edged on both sides with the same shade of light brown as the median line, with which it runs nearly parallel, being farthest apart at the interior margin; the subterminal space has the veins marked with faint whitish lines, and a row of black spots along the terminal line. Fringes metallic cinereous, with a fuscous line running nearly parallel with, and about one third from the terminal line. Hind wings of the same color as the fore wings, but somewhat lighter; fringes whitish.

Described from three specimens taken at Wenonah, N. J., July 27, 1905, July 15, 1906, and at Philadelphia, Pa., July 6, 1905.

C. daeckellus n. sp.

Expanse of wings, 27-31 mm. Head and palpi ochreous on top, brownish on the sides, thorax dark brown, pale ochreous through the centre vertically; fore wings fusco-ferruginous, with a broad silvery white stripe starting from the base near the costa, tapering acutely outwardly, and ending in a point; a tooth on the costal side near the centre of the stripe, and another below, which meets a fuscous line running from near the base to the terminal line; parallel with this line are two shorter metallic lines, above which, between veins 4 to 6, is a white stripe to the subterminal line; subterminal line silvery, bordered with white on the costa, and forming an obtuse angle at its first third, then running nearly straight to vein 2, where it forms another slight angle interiorly. The hind margin has a white stripe from the base nearly to the subterminal line. Upon the apex is a white triangle with a brown triangle above it. The terminal line is dark brown at the apex and a black spot on each of veins 2, 3, 4, 5 and 6. Fringe white at the apex, below that greyish metallic. Hind-wings and abdomen whitish to pale fuscous; fringe white.

Described from three specimens taken by Mr. E. Daecke at Brown's Mills Junction, N. J., May 30 and June 17, 1906, and at Da Costa, N. J., June 3, 1906, and one specimen taken by Mr. P. Laurent at Clementon, N. J., May 9. Named in honor of Mr. E. Daecke, of Philadelphia.

Hæmatopsis grataria annettearia.

Body of the same color (ochreous-yellow) as the typical specimens; fore-wings entirely pink, except at the costa, where there is a slight suggestion of yellow; the discal dot is a shade darker than the rest of the wing. Hind-wings of the same color as the fore-wings, but in some of the specimens the ochreous color shows through at about two-thirds from the base, through the centre of which the outer band can be indistinctly located, and from either side of this band the yellow blends gradually with the pink. Discal spot also visible, under side of wings suffused with pink as above, though not so markedly.

Described from eleven specimens taken at Cincinnati, Ohio, for several successive years, by Miss Annette F. Braun, for whom it gives me great pleasure to name this beautiful variety.

ANOTHER *Thecla* tangle.—Having had occasion to study some theclas for Mr. H. H. Brehme I came to the conclusion that *Thecla henrici* Grote and Robinson is a pure synonym of *irus* Godart. Grote and Robinson give as localities for *henrici* "Atlantic District. (Maine! to Pennsylvania!)"

"This species is intermediate between *Thecla augustus* Kirby (*T. angustinus* Westw.) and *Thecla irus*, as illustrated by Boisduval and Le Conte." The figure by Bd. and Lec. is large and crude, but represents the species found south and also from Maine to Pennsylvania. *Arsace* in the same species showing a light colored discal area, not uncommon in the species. I believe *henrici* was described because it did not fit the figure of *irus* Bd. Lec.—HENRY SKINNER.

A New Bee of the Genus Crocisa.

By T. D. A. Cockerell.

Crocisa beatissima n. sp.

♀. Length about 11 mm.; black with blue markings. Superficially similar to *C. cæruleifrons* Kirby (*quartinæ* Gribodo), but differing as follows: markings of thorax and abdomen turquoise-blue, bright but *not shining*; hair of face white with a faint bluish tint; ocelli larger; scutellum (which is without spots) with the hind margin broad W-shaped, not —^—-shaped; blue mark on each side of first abdominal segment like a large L placed sideways; the end of its foot with a large cuneiform appendage directed mesad, the point where the black invades the blue laterally being broadly rounded; hind tibiæ with the basal two-fifths bluish-white; basal joint of tarsi white outside.

Hab.—Adelaide, Australia, June, 1897. Received from the British Museum; collector unknown to me.

The Australian species of *Crocisa* with blue or bluish spots may be separated as follows:

At least some of the abdominal segments 4-spotted . . . . 1.
None of the abdominal segments 4-spotted, the lateral marks being undivided . . . . 2.
1 Margin of scutellum — · —-like . . . . **lamprosoma** Boisduval.
Margin of scutellum W like . . . . **turneri** Friese
2. First abdominal segment covered with blue pile, except a narrow inferior margin . . . . . **novæ hollandiæ** Lepel.
First abdominal segment with an entire basal blue band; margin of scutellum ∴-like; blue markings shining . . . **nitidula** Fabr
Abdominal bands all interrupted in the middle 3
3. Blue markings shiny; margin of scutellum — · —-like . 4
Blue markings not shiny; margin of scutellum ∴ like 5
4 Hair on middle of occiput black with white on each side; apex of male abdomen more narrowly truncate **cæruleifrons** W. F. Kirby.
Occiput with a complete conspicuous fringe of white hair; apex of male abdomen more broadly truncate size smaller, not over 9 mm . . . . **darwini** Ckll.
5 Large, about 15 mm; markings of abdomen pale blue **tincta** Ckll.
Smaller, about 11 mm; markings of abdomen bright blue **beatissima** Ckll

C. novæ-hollandiæ Lep was placed by F. Smith, in 1854, as a synonym of *lamprosoma*, and this has been uncritically followed by later authors. It may also be remarked that *C. emarginata* Lep (type locality Port Pralin, New Ireland) is a species with shining blue markings, and appears to have been wrongly interpreted by Bingham and Friese.

The Identity of Thecla calanus and edwardsi.

BY HENRY SKINNER.

Some time ago Mr. Edward D. Keith, of Providence, R. I., sent me some butterflies to name, and among them were some Theclas which I believe I determined to be *calanus*. Mr. Keith said he thought they were *edwardsi*, and this led me to investigate these two so-called species. In my collection I have my specimens named, as near as may be, in accordance with the literature and lists, and, as occasion or interest in special ones demand, I try to get them nearer to nature. To elucidate these problems we need large series of specimens with accurate data. I am indebted to Dr. James Fletcher for specimens of *edwardsi* from places in Canada and to Mr. H. H. Brehme for a number of *calanus* from New Jersey. In all I had before me 73 specimens, and, assuming some light colored ones from London and Toronto, Canada, were *edwardsi*, I divided the lot on the basis of color—dark ones as *calanus* and light ones as *edwardsi*. This gave 45 *calanus*, 27 ♂ and 18 ♀, and 28 *edwardsi*, 18 ♂ and 10 ♀. The brick-red spot at anal angle of secondaries above is not usually present. Three ♂ and 5 ♀ *calanus* have it, and 6 ♂ and 5 ♀ *edwardsi*. The color of the wings in the lots provisionally divided into *edwardsi* and *calanus* varies among the individuals. The extra-mesial band on the primaries below has been supposed by Mr. S. H. Scudder * to supply the character by which the two can be separated. In about 40 *calanus* this band consists of a dark line (slightly darker than ground color of wing) with outer edge narrowly white. This may be said to be divided into nearly quadrate spots by the nerves. In five specimens these spots become more or less oblong. In *edwardsi* 21 are quadrate and 7 oblong. A typical specimen of either *calanus* or *edwardsi* has a lunate red spot on secondaries below, and I find in some cases such may extend along the marginal band until there are four. The little patch of red on inner margin of secondaries below may be present or absent, and has no significance. The mesial band of primaries is variable, and I see absolutely no differential characters in it. The distribution of a species is always interesting and instructive, and I therefore give the localities of the specimens and dates of capture so far as they exist on the pin labels.

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* Proc. Boston Soc. Nat. Hist., xiii, 272, 1870,

Calanus. Nashville, Tenn., vi, 8; Beulah, Manitoba, vii, 16; vii, 28; Ohio; Runnels Co., Tex., v, 10; Wilmington, N. C., vi, 5; Philadelphia, Pa., vi, 10; viii, 24; Lake George, Fla.; Colorado; Newark, N. J., vii, 4; Elmwood, R. I., viii, 8; Jacksonville, Fla., v, 5; Atlanta, Ga.; Toronto, Ont., vi, 20; vii, 9; Beulah, New Mex., vii, 16.

Edwardsi. Minneapolis, Minn., vii, 8; Iowa; Toronto, Ont., vii, 9; vii, 23; Platte Canyon, Colo., vi, 23; Canadensis, Pike Co., Pa., viii, 12; London, Ont.; Chicago, Ill., vi, 4; Round Mountain, Blanco Co., Tex., v, 17. The distribution does not show anything conclusive. Among the lot sent by Dr. Fletcher are dark specimens taken at Toronto by Arthur Gibson on same dates as light ones. Moreover, most of the Canadian specimens are somewhat old and flown, and would therefore be lighter in color. The specimens exhibit the usual variation in size found in all butterflies. My conclusions are that under the names *calanus* and *edwardsi* we have but one species. My division into dark specimens (*calanus*) and light specimens (*edwardsi*) was for purposes of study. For sake of brevity I have not gone into the general synonymy of the names treated.

* * *

Notes on American Hemiptera.

By E. Bergroth, M.D., Duluth, Minn.

III. The Acanthosomatinæ of North America*

In his "Check-list" (1886) Uhler enumerates five North American species of this subfamily. By placing three of them as synonyms Van Duzee has reduced this number to two in his "Annotated List of the Pentatomidæ Recorded from America North of Mexico" (1904), but he describes one new species and one new variety. All the North American species are placed in the genus *Acanthosoma* by these authors. Since my moving over to this side of the Atlantic, I have had occasion to examine most of the American forms of this group, and find that the genus *Acanthosoma* does not occur in America at all, the species referred to this genus by the American authors belonging to other genera. That they have not hitherto been correctly located may partly be due to the circumstance that the palearctic genera of this subfamily have been badly mixed up in the catalogue of Lethierry and Severin. By aid of the following characters our species are easily located :

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* Nos. I and II have been published in the Canadian Entomologist.

Acanthosoma Curt.—Mesosternal lamina not prolonged backward. Mesosternum at the base behind the lamina a little elevated ; the elevated part longitudinally excavated or sulcated (Old World genus).

Elasmostethus Fieb., Stal.—Mesosternal lamina prolonged backward between or behind the middle coxæ. Posterior lateral margins of the pronotum neither depressed nor ampliated. Posterior angles of pronotum obtuse, not projecting backwards. Orificia long, about three times as long as the distance between their apex and the anterior angle of the metasternum.

To this genus belong (1) *cruciatus* Say, (2) *atricornis* V. Duz., (3) *cooleyi* V. Duz., which I have not seen. It is described as a variety of *cruciatus*, but, judging from the description, I think there can be no doubt that it is a different species.

Elasmucha Stal (*Clinocoris Hahn*).—Mesosternal lamina as in *Elasmostethus*. Posterior lateral margins of the pronotum depressed and ampliated. Posterior angles of pronotum angularly projecting backwards. Orificia rather short, less than twice as long as the distance between their apex and the anterior angle of the metasternum.

To this genus belongs (4) *lateralis* Say. The name *Clinocoris* cannot be accepted for this genus, being pre-occupied by Fallén for the bedbug.

According to Distant, *A picicolor* Westw., described from an unknown locality, is a synonym of *lateralis* Say ; but Horváth, who has also examined Westwood's type, says that it is the same species as the palearctic *fieberi* Jak. Both these authors may be right, for it is not impossible that *fieberi* will prove to be identical with the nearctic *lateralis*. I have no specimen of *fieberi* here for comparison, and must leave this question unsettled. Distant has described an *Acanthosoma flammata* from Mexico. From the quite inadequate description it is impossible to say to what genus it belongs, but it is very unlikely that it is an *Acanthosoma*.

IV.—On Two Reduviidæ from British Guiana.

Repipta spinosa Fabr.

Mr. Van Duzee has communicated to me specimens of this (or a very closely allied) species. In describing the types in his "Hemiptera Fabriciana" Stal placed *Zelus spinosus* Fabr. and *sexdens* Fabr. in the genus *Repipta* Stal, but later, when the types were not before him, he removed them to the genus *Corcia* Stal, apparently with some hesitation. They are, however, much better placed in *Repipta*.

Diaditus pilosicornis n sp.

Testaceous, membrane and inner part of corium pale grayish; the ocelliferous tubercle, the rostrum, two median pronotal vittæ coalescing on the anterior lobe; a sublateral basal streak to scutellum; an abbreviated claval streak; a streak near the inner apical angle of the corium and a shorter outer streak in front of the discoidal cell; two somewhat obscure longitudinal fasciæ to the meso- and metapleura; two elongate spots, the posterior of which is shorter, to the lateral margins of the abdominal segments, and a sublateral ventral vitta, fuscous; a large triangular posteriorly sinuated spot on the discoidal cell; an irregular abbreviated basal streak on the inner basal cell of the membrane; a small basal spot and a broad vitta, sinuated anteriorly and strongly narrowing posteriorly, on the outer basal cell of the membrane, very close to the external margin, velvety brownish black; the other parts of the membrane mottled with pale fuscous, apex of femora and of tibiæ and the tarsi infuscated, head with the apical processes starting from a common base, somewhat reflexed, not quite reaching the middle third of first antennal joint, separated by a very narrow subparallel interstice, with the internal margin straight and the external margin distinctly longitudinally convex; ocelli placed on the outer side of a raised, rounded tubercle, which is longitudinally sulcate in the middle, interocular space on the underside somewhat broader than the rostrum (♂); first joint of antennæ a little longer than the distance between the interocular furrow and the apex of the antenniferous tubercle, glabrous; second joint twice as long as first, longly erectly pilose, third and fourth joints short, finely pilose; fourth longer than third, pronotum rectangular at apex, with two obtuse keels somewhat diverging backwardly in the hind lobe; lateral angles acute a little raised and distinctly prominent, scutellum horizontal at apex; hemelytra almost reaching the middle of the last dorsal segment (♂); abdomen (♂) with the last dorsal segment rounded, rather broadly and deeply sinuate at apex; carinated on the under side from its base to the apex of the fifth segment; second male genital segment four times as long as first, sinuate at apex. Length, ♂ 11.5 mm.

Demerara (R. J. Crew).

Akin to *D. hirticornis* Champ., but it is larger; the frontal spines are not divergent; the first antennal joint is much shorter; the lateral angles of the pronotum are more acute and prominent, and the last dorsal segment of the male is differently shaped.

This is the insect referred to by Van Duzee in Trans. Amer. Ent. Soc., 1901, p. 350, as *Narvesus sp.*

N. B.—The allied Australian genus *Agylla* Stal must bear the later name *Thelocoris* Mayr, the first name being preoccupied (Walker, Lepidoptera, 1854).

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The Bees of Nebraska.—I.

FAMILY PANURGIDÆ.

Genus **PERDITA** F. Smith.

By Myron H. Swenk and T. D. A. Cockerell.

1. **Perdita albipennis** Cresson.

This species is present over the entire State, specimens from Sioux County, Bridgeport, Haigler, Springview, Carns, West Point, Lincoln and Nebraska City having been examined. It flies from June 23 to September 14, visiting abundantly the flowers of *Helianthus annuus* and allied species, but is to be found on *Solidago, Grindelia* and *Rudbeckia* also.

2. **Perdita lacteipennis** n. sp.

♀.—Length, 9-10 mm.—Head and thorax blue-green, the former element predominating on head and metathorax, the latter on mesothorax, which has also an æneous tinge. Ends of mandibles, a narrow cuneate mark in the middle of the otherwise unmarked, shiny and sparsely punctured clypeus, a quadrate mark on each side of the face between the clypeus and the eye, a line on scape in front, a line on prothorax, a very large spot on tubercles, all of the knees and a broad stripe down the front of anterior tibiæ, yellow. Flagellum reddish testaceous beneath. Wings milky white, nervures and stigma pallid. Tegulæ pale. Abdomen black, the first segment with a large spot on each side, segments 2-5 crossed by very broad yellow bands, the first two sub-basal, oblique, and strongly notched on the posterior margin (sometimes completely narrowly interrupted), the last two submedian, transverse and continuous. Pygidium brown. Pubescence of head and thorax short, erect and white, densest on the cheeks and pleura, grayish white on the legs, the hair on last three abdominal segments and the ventral fringe ochraceous gray.

♂.—Length 8-9 mm.—Black, the head and thorax strongly reflecting blue, only the mandibles, a narrow line on front of scape, knees and a variably-sized stripe on anterior tibiæ yellow; tarsi brownish; pygidium abruptly yellow; apical margins of the segments depressed, impunctate, steely.

Types: Pair taken in copula, Niobrara, Nebraska, August 13, 1902, on *Helianthus annuus* (M. H. Swenk). There are also 49 female and 71 male paratypes from Long Pine, Carns, Neligh, Springview, Glen, Crawford, Warbonnet Canon, Imperial and Haigler, Nebraska, thus representing the entire northwestern half of the State. While most frequent on *Helianthus*, this species visits also, but not frequently, the flowers of *Rudbeckia, Petalostemon violaceus, Campanula petiolata, Medicago sativa, Carduus altissimus* and *Verbena* sp. It flies from June 23 to August 25.

Perdita lacteipennis is quite close to *P. albipennis*, but differs at once in its larger size and in a reduction of the yellow markings. The male of *albipennis* may easily be told by its yellow markings on clypeus and sides of face (completely lacking in *lacteipennis*), much broader stripe on front of scape and on anterior tibiæ, larger knee spots, more yellowish flagellum and yellow tarsi; the female of *albipennis* has the apical margin of the clypeus yellow, in addition to the median cuneate mark, more yellow on scape and legs, and much narrower abdominal bands. One would be inclined to consider it merely a variety of *albipennis* were it not for the fact that in western Nebraska both species occur together and are yet perfectly distinguishable, *lacteipennis* running out eastwardly so that *albipennis* occurs alone in eastern Nebraska.

3. **Perdita laticincta** n. sp.

♀. Length about 5 mm. Head and mesothorax brassy green, the prothorax and metathorax blue. Clypeus black, with a large subpyriform yellow spot occupying most of the median area, the sides of face between the clypeus and eye with a small quadrate yellow spot, which sometimes extends up a short distance along the orbit, the mandibles and a spot on tubercles also yellow. Scape in front and flagellum below yellowish. Tegulæ yellow. Wings milky white, the nervures and stigma pallid. All of the knees and the front face of the anterior tibiæ yellow, legs otherwise brownish black. Abdomen brownish black, all of the segments except the last, crossed by very broad, subbasal, yellow bands, the first three notched medially on the posterior margin. Pygidium and venter brownish black. Pubescence short, erect, pure white, densest on cheeks, pleura and as fringes on the last three abdominal segments.

♂.—Length 4-5 mm.—Mandibles, labrum, a line half way up posterior margin of eye orbit, clypeus, supraclypeal area, sides of face in a broad line extending far beyond insertion of antennæ and ending truncately, scape and all except a portion of upper surface of flagellum, deep yellow, the dog's-ear marks contrastingly black. A line on prothorax extending to large spots on the tubercles, yellow. All the knees, the front face of all the femora and of first four tibiæ and anterior tarsi within yellow. Abdomen five-banded as in ♀, the two last segments dark. Otherwise like ♀.

Types: Glen, Sioux County, Nebraska, August 20, 1906, on *Helianthus petiolaris* (H. S. Smith), ♀ ♂.

Paratypes: 23 ♀ ♀ and 49 ♂ ♂ from the type locality, Warbonnet Canon, Crawford, Niobrara and Neligh, Nebraska.

This species flies from July 12 to August 24, and though primarily a visitor of *Helianthus,* it occasionally strays to the flowers of *Solidago missouriensis* and *Melilotus alba* also. It is very distinct in its markings and has no close relative. In the tables of *Perdita* in Proc. Phil. Acad. Nat. Sci. the ♀ runs to *bigeloviae* and the ♂ to *sphaeralceae* var., but it is not either of those.

4. **Perdita nebrascensis** n. sp.

♀.—Length 6 mm.—Head, prothorax and mesothorax æneous green marked with yellow, the metathorax abruptly blue. A basal trilobate clypeal mark (the lateral lobes being very small and short, the median one large and broad), the supraclypeal area, subtriangular lateral facemarks running up contiguous to the orbits and terminating acutely just beyond level of insertion of antennæ, spot at base of mandibles, whole scape and the flagellum beneath, a large spot on tubercles, first four tarsi, their tibæ inside and below, and all the knees, yellow. Tegulæ yellow. Wings hyaline, their nervures dark, the stigma pale centrally. Abdomen black, the middle of segment 1 with a narrow, medially interrupted yellow band, the base of segments 2-5 with similar narrow transverse bands, continuous but not attaining the lateral margins of the segments, the last one very narrow, the pygidium pale. Venter brown, the segments broadly edged with testaceous. Pubescence all pure white, longest on cheeks, pleura and tip of abdomen.

♂.—Length 5.5-6 mm.—A streak contiguous to lower half of posterior orbits, mandibles, labrum, whole of face up to one-third the distance between insertion of antennæ and anterior ocellus, and farther laterally, whole of antennæ except a dorsal spot on pedicel, a line on prothorax connecting with the spot on tubercles, four anterior legs except broad lines on tibiæ and femora behind, posterior coxæ, trochanters, femora in front and all the knees, bright yellow. Abdomen with yellow bands in middle of 1 and bases of 2-5, broader than in ♀, usually all medially interrupted or notched, the last ones broadly so, segment 6 dark, venter pale yellowish. Otherwise like the ♀. Head round, face and whole of thorax hairy.

Types: Neligh, Nebraska, August 7, 1901, on *Helianthus* (M. Cary), ♀ ♂.

Paratypes: 14 ♂♂; type lot, 9 ♂; type locality, July, 3 ♂; Niobrara, Nebraska, August 13, 1902, on *Helianthus* (W. D. Pierce), 2 ♂.

This species is most closely allied to the recently described *P. dallasiana* Ckll., but differs from that species in larger size, deep yellow of face, less yellow on cheeks, no yellow marks on pleura and different abdominal markings. It looks much like *P. sphaeralceae* Ckll., especially the abdomen, but the head and thorax are quite different. The female runs in the tables to *P. bigeloviae* var., but is not that species.

5. **Perdita dolichocephala** n. sp.

♀.—Length, 6 mm. Head and mesonotum dark metallic green, strongly and densely punctured, the prothorax, metathorax and pleura dark metallic blue and much more finely punctured. Face unusually long and narrow, with the inner margins of the orbits subparallel. Clypeus very sparsely and shallowly punctured, typically with a large median subpyriform area and lateral margins expanding into a spot in the lower corners, pale creamy yellow, but sometimes entirely black. Typically, also, with yellow lateral face marks running up along the orbits to terminate truncately at level of antennæ and below swollen into a large spot, but these also sometimes lacking. Mandibles usually yellow, sometimes black, labrum always black. Antennæ dark, sometimes yellow for a short distance at extreme base. Tegulæ pale, the wings clear and with pale nervures and stigma. Legs blackish except the anterior knees and inner surface of anterior tibiæ, which are yellow. Abdomen varying from black to brownish black, the bases of the first three segments typically with two short yellow marks, one on each side, marking the rudiments of a semi-obsolete, widely interrupted band, these marks sometimes entirely absent. Venter black. Cheeks, occiput, pleura, legs and last three abdominal segments with long, erect, pure white hair, the clypeus, face and mesonotum with shorter and thinner pubescence.

♂.—Unknown.

Type: Warbonnet Canon, Sioux County, Nebraska, July 23, 1901, on *Helianthus* (M. A. Carriker, Jr.), 1 ♀.

Paratypes: Niobrara, Nebraska, August 13, 1902, on *Helianthus* (W. D. Pierce), 2 ♀.

The three specimens placed here differ widely in their face and abdominal markings, but on close study prove to be but variations of a single very distinct species, characterized by the long head, which is suggestive of *Conanthalictus*. The type has well-developed face marks and abdominal marks, but one of the paratypes completely lacks all trace of face markings and has even better developed abdominal marks than the type, while the other paratype has the face marked like the type, but lacks any abdominal marking.

6. **Perdita fallax** Cockerell.

This species has been taken only in Sioux County, where it flies from June 27 to August 19, visiting a small species of *Helianthus* and also, though less commonly, *Gutierrezia sarothrae*. A series of 14 females and 15 males was collected in Warbonnet Canon, July 12, 1901, on a small *Helianthus*, and the occurrence of so many at the same time on the same flowers leaves no doubt as to the correct matching of the sexes. The females, while not typical, are so close to *fallax* that no separation from that species can be justified, while the males prove to be unquestionably the same as the type of *P. erigeronis* Ckll., known only in the male, and described from Mesilla Valley, N. M., at *Erigeron*, in May. *P. erigeronis* Ckll., then, must be considered as the unknown male of *P. fallax* Ckll.

7. **Perdita affinis** Cresson.

West Point, Cedar Bluffs and Nebraska City, Nebraska, August 30 to September 12, uncommon at flowers of *Solidago rigida*, and, late in the season, on *Aster*.

8. **Perdita bruneri** Cockerell.

Lincoln and West Point, Nebraska, August 6 to September

12, abundant on *Solidago rigida* and *Grindelia squarrosa*, especially the former.

9 **Perdita cockerelli** Crawford.

Lincoln, West Point, Broken Bow and Sioux County, Nebraska. In Sioux County it flies during August or longer, visiting the flowers of *Solidago missouriensis*. In eastern Nebraska it flies from August 6 to October 6, almost exclusively on *Grindelia squarrosa*, but also, rarely, on *Aster* late in the season. This species is not nearly so common as *bruneri*, which it so much resembles.

10. **Perdita crawfordi** Cockerell.

Lincoln, Nebraska, August 22 to September 1, abundant at flowers of *Grindelia squarrosa*, rarely straying to *Helianthus annuus* also. Strangely, this species has never been taken away from the environs of the salt flats west of Lincoln.

11. **Perdita ignota** Cockerell.

No additional specimens of this species have been captured since the one recorded from Lincoln in September, in Ent. News, viii, p. 24. It has been taken by Messrs. C. R. Jones and W. D. Pierce at Clarendon, Texas, at flowers of *Grindelia squarrosa*.

12. **Perdita punctata** Cockerell

Also known from Nebraska only through the one ♀ specimen captured at Lincoln in September, and recorded with *ignota*.

13 **Perdita maura** Cockerell.

Lincoln, West Point and Cedar Bluffs, Nebraska, July 27 to October 1, at flowers of *Physalis*, and, late in the season, on *Aster*.

14 **Perdita gutierreziae** Cockerell

Four females and twenty four males collected August 18 to [illegible], at flowers of *Gutierrezia sarothrae* at Glen, Sioux County, Nebraska. The female of *gutierreziae* has never been described, and is exceedingly similar to *P. rhodura* Cockerell, but the male of *rhodura* is quite distinct from that of *gutierreziae*.

15. **Perdita melanostoma** n. sp.

♀.—Length, 5.5 mm.—Head dark green, changing to greenish blue on occiput and cheeks, and to deep black on the clypeus, the mesonotum æneous green, with remainder of thorax deep blue. Usually a round yellow spot on each side of clypeus, and mandibles more or less completely yellow. Antennæ brownish black, the flagellum yellowish beneath. Legs black, with all the knees, first four tibiæ in front, and the anterior tarsi, yellow. A small spot on tubercles, whole of tegulæ and bases of the wings yellow. Wings clear, nervures blackish, stigma brownish fuscous. Abdomen black, the middle of segment 1 and bases of 2-4 with broad, narrowly medially interrupted or notched, transverse yellow bands. Venter fuscous. Cheeks, mesonotum, pleura, legs, last two abdominal segments above, and whole of venter with peculiar, sparse, very erect, bristle-like and heavy, pure white pubescence, long only on abdomen tip and posterior legs.

♂.—Unknown.

Type: Glen, Sioux County, Nebraska, August 19, 1906, on *Gutierrezia sarothrae* (P. R. Jones), ♀.

Paratypes: 25 ♀ ♀ from type locality, August 18-22, 1906, on *Gutierrezia sarothrae.*

This species runs out near *P. subfasciata* and *sphaeralceae,* but is neither; the former has the whole head and thorax dark bluish green, almost black, and the mandibles wholly dark, and flies at flowers of *Chrysothamnus.*

16. **Perdita luteola** Cockerell.

Thirty-eight females and nineteen males, August 12-22, 1906, on *Gutierrezia sarothrae* at Glen, Sioux County, Nebraska.

17. **Perdita perpallida** Cockerell.

The co-types of this species, taken at Neligh, Nebraska, in July (M. Cary), at flowers of *Petalostemon violaceus,* are the only specimens so far captured.

18. **Perdita wootonae** Cockerell.

This species flies in abundance in northwest Nebraska, visiting exclusively the flowers of *Nuttalia nuda* from July 28 to August 22. A series of over 250 specimens from Crawford and Glen shows that the male is dimorphic, some specimens having very small, round, unarmed heads, while others have enormous, heavy heads with strong cheek spines. These two extremes intergrade. The type of *wootonae* has black tarsi, but this character is variable and all the Nebraska specimens examined have the tarsi pale. The pleural spot is also variable in size, and is frequently entirely lacking, so that this character cannot be depended upon to separate *wootonae* from *perpallida*. However, *perpallida* has the second submarginal cell more narrowed above and is of a paler color generally, lacking the greenish tinge to the scutellum, metathorax and pleura which makes these parts contrast with the mesonotum and vertex in *wootonae*. The two are very close and may not be specifically distinct, but the difference in the flowers visited would argue for their separation.

19. **Perdita zebrata** Cresson.

Glen, Crawford, Bridgeport and Gering, Nebraska, July 28 to August 22, at flowers of *Cleome serrulata, Helianthus petiolaris* and *Solidago missouriensis*. On close examination of a series of nearly 200 specimens the supposed external distinctions between *P. zebrata* and *P. bakerae* break down; the genitalia characters have not been further investigated.

20. **Perdita stottleri flavida** n. subsp.

♀ Length, 7 mm.—Similar to *P. stottleri*, but larger, with the light parts of the abdomen canary yellow instead of cream color, the dark parts of the head and thorax æneous green instead of bluish green, and the hind femora entirely yellow, lacking the large black mark of typical *stottleri*.

♂ Differs from the ♂ of *stottleri* by the æneous green instead of bluish green color of the head and thorax and the presence of a black mark on the hind tibiæ.

Type: Glen, Sioux County, Nebraska, August 22, 1906, on *Gutierrezia sarothrae* (L. Bruner), ♀, ♂.

Paratypes. Type lot, 3 ♀♀ and 2 ♂♂; type locality, August 17, 1906, on *Solidago missouriensis* (P. R. Jones, 1 ♂

This subspecies is quite near to *P. stottleri* Ckll., which was described from Tularosa Creek at edge of Mescalero Reservation, New Mexico, and which also visits *Gutierrezia*, but differs from the type as above, apparently representing a valid subspecies.

Of the above twenty species, eleven have their type localities in Nebraska, five were originally described from New Mexico, three from Colorado, and one from New Mexico and Colorado. There are also before us five unique male Perditas from Nebraska some of which are apparently new, but their naming is deferred until the accumulation of additional material.

ENTOMOLOGICAL NEWS.

[The Conductors of Entomological News solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. Entomological News has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

PHILADELPHIA, PA., FEBRUARY, 1907.

Entomologists in general are desirous of having their collections named, and in many cases do not know the persons studying special groups to whom they could apply. We have thought it would be useful to publish the names of those persons who are willing to do this work. We will also be pleased to hear from specialists who are willing to send in their names for this purpose, and we will publish them in our next issue. The News assumes no responsibility in this matter, and all details should be arranged between the collector and the persons making the determinations.

The following persons will be pleased to name the groups mentioned:

Mr. William Beutenmüller, American Museum of Natural History, 77th St. & 8th Avenue, New York, N. Y. Cynipidæ and *Catocala.*

Professor Herbert Osborn, Ohio State University, Columbus, Ohio. Homoptera.

Professor E. A. Smyth, Jr., Virginia Polytechnic Institute, Blacksburg, Virginia. Sphingidæ of the world.

Dr. Henry Skinner, Academy Natural Sciences, 1900 Race Street, Philadelphia, Penna. North American Butterflies (Expanded).

Dr. Philip P. Calvert, Academy Natural Sciences, 1900 Race Street, Philadelphia, Penna. Odonata.

J. A. G. Rehn, Academy Natural Sciences, 1900 Race Street, Philadelphia, Penna. Orthoptera.

This list should be greatly increased, and we hope to get many names. We could add more now, but don't like to do so without permission.

Entomological Literature.

THE ALEOCHARINÆ BY CASEY.—The Academy of Sciences, of St. Louis, has lately published a paper from the pen of Major Thomas L. Casey with the title "Observations on the Staphylinid Groups Aleocharinæ, etc." A few criticisms of this paper are offered here.

Page 144. *Aleochara fuscipes* Gravh is synonymous with *curtula* Goeze. Specimens so identified are in my collection from Colorado, Illinois, and West Virginia.

Aleochara lustrica Say is a variety of *curtula* Goeze.

Aleochara lateralis Heer is synonymous with *crassicornis* Boisd., Lac.

Page 147. *Aleochara* (*Xenochara*) *puberula* Klug is a cosmopolitan species. I have a specimen from Pasadena.

Aleochara milleri Kr. is a true *Baryodma.*

Page 152. *Aleochara castaneipennis* Esch. should read Mannh.

Poge 158. *Aleochara* (*Baryodma?*) *densiventris* Casey. The specific name is pre occupied. Dr. M. Bernhauer described a Californian species under this name (Deutsche Ent. Ztschr., 1906. Heft ii, p 146). Major Casey writes me that he himself has discovered this synonomy.

Page 160. *Aleochara* (*Baryodma*) *nitidicollis* Casey is also pre occupied by Solier ((Gay, Hist. Chil iv, 352). Fauvel believes that the species so named by Solier belongs in the genus *Homalota*(*?*).

Page 162 *Aleochara cuniculorum* Kr. belongs in the subgenus *Rheochara* (teste Bernhauer)

Page 163. *Aleochara bipunctata* Ol. is synonymous with *bipustulata* L.

Page 164. *Aleochara nitida* Gravh. is synonymous with *bipustulata* L.

Page 165 *Aleochara languida* Gravh. should read Sachse. It is either identical with *verna* Say or a variety of the same.

The five species created by Major Casey at the cost of *Aleochara sulcicollis* Mannh are local forms of a very variable species hardly worth naming.

Page 182 *Aleochara* (*Polychara*) *graciliformis* Fauv. in litt., is *gracilicornis* Brnh (Stett Ent Ztg., 1901, 372), and is described from Massachusetts. It occurs also in Canada (teste Harrington), Sparman Lake, Ont (teste Hamilton), and Mount Washington (teste Slosson)

Page 191 The width of the abdomen of *Trachyota lativentris* Casey is given as 7 2 mm., a typographical error.

Page 244 *Falagria* (*Lorinota*) *gracilis* Casey is said to visit pines, an accidental habitat, as Falagrioid species occur mostly near water *Lorinota* will probably prove to be identical with *Falagria* and the species *gracilis* Casey will have to receive another name (*vide gracilis* Motsch from India)

The above remark applies also to *Falagria* (*Lorinota*) *parva* Casey, (*vide parva* Kr from Ceylon)

Page 259 *Tachyusa vaga* Lec. is a *Myrmecopora.*

Page 267 *Stictalia arcuata* Casey. *Stictalia* will probably prove to be identical with *Bolitochara*, and the species *arcuata* Casey will have to receive another name (*vide arcuata* Fvl. from Chile).

Page 273. *Venusa blanchardi* Casey is a synonym of *Bolitochara picta* Fvl.

Page 279. *Diestota mayeti* M. & R. is a synonym of *testacea* Kr.

Page 282. *Eumicrota humeralis* Casey. *Eumicrota* will probably prove to be identical with *Gyrophæna*, and the species *humeralis* Casey will have to receive another name (*vide humeralis* Shp.).

Page 287. *Phanerota angularis* Casey. See above remark (*vide Gyrophæna angularis* Epp. from West Africa).

Page 291. *Gyrophæna flavicornis* n. sp. is a typographical error, and should read Melsh.

Page 315. *Oxypoda ancilla* Casey. The specific name is pre-occupied, *vide O. ancilla* J. Sahlb. Sv. Vet. Akad. Handl. xvii, 86, 1880–81. I change the name of the species to *dubia*.

Page 322. *Drusilla* Leach is pre-occupied; *Astilbus* Steph. takes its place.

Page 336. *Macroterma borealis* Casey. This genus will probably not stand, and *borealis* is pre-occupied by *Atheta borealis* Sahlb = *atramentaria* Gyllh.

Atheta (*Homalota*) *granulata* Mannh. Mannerheim described the species as an *Aleochara*, and not as a *Homalota*; *granulata* is identical with *graminicola* Gravh. The generic name *Elytrusa* is superfluous.

Page 351. *Leptusa tricolor* Casey. The specific name *tricolor* is pre-occupied by Scriba for a species from Spain (Scriba, Heyd. Sp. 75). I change the name of the species to *caseyi*.—A. Fenyes, M. D.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

I have taken the liberty of writing you on this occasion concerning a matter which I feel sure will be of interest to you and worthy of your consideration.

This is in relation to the forming of an entomological club here in Southern California. The time is surely at hand when an organization of this nature should meet with success. Within the past few days a number of enthusiasts in this line have assembled and discussed the matter in question, and they are all of the opinion that the project will surely carry.

The names of those interested in entomology in and about Los Angeles have been listed, and notices will be sent out to all with the hopes of their becoming interested in the matter, and so much so that they will attend the first meeting for organization, to be held at my residence, 1410 South Burlington Avenue, on the evening of Thursday, January 17, at eight o'clock.—E. K. Harvey.

No one has done more to advace our knowledge of Central American insects than Mr. G. C. Champion, now of Horsell, Woking, England, who has not only made large collections in all orders for the *Biologia Centrali Americana*, but has also described important sections of the Coleoptera and the Heteroptera in that work. The Editors of the News therefore take much pleasure in presenting to our readers, on another page of this issue, an itinerary of his travels, which Mr. Champion has kindly prepared at our request.

If You lack a number of *Entomological News*, dont wait four or five years to ask for it as your chances of getting the number will be very small. The demand for the News has been very great and back volumes are rapidly exhausted. If you do not get your copy send a postal to the News at once.

I would like to see some more on Noctuidæ within the News. Couldn't you prevail on somebody to write some articles on the life histories of our eastern Plusias especially the larval stages and food plants?

—Edward D. Keith, Providence, R. I.

Last October my father brought me nine specimens of *Vanessa j album* from Norfolk Conn. He said he had seen a number of them around the hotel, some of them tapping against the windows as if they desired to winter there.

Last summer there was found here a pecular looking caterpillar. It was yellow with the oblique bands pink. It was evidently *C. juglandis*, for when it changed to a chrysalis it was exactly like other *C juglandis* pupæ.—Kate W. Strong, Setauket, Long Island, N. Y

The initial meeting of the Entomological Society of America was held in the American Museum of Natural History at New York City, December 28, 1906.

On the evening of December 28, Prof. Wm. M. Wheeler delivered before the society an illustrated lecture on "The Polymorphism of Insects." Immediately after the lecture occurred the business meeting Prof. J. H. Comstock of Ithaca, N Y. was elected chairman and E. S. G. Titus of Washington, D C secretary of the meeting. The new society then adopted a constitution and by-laws and elected officers and members of the executive committe.

The following are the officers: President, J H Comstock, Ithaca, N. Y. 1st Vice President, James Fletcher, Ottawa, Can, 2nd Vice President, Henry Skinner, Philadelphia, Pa., Secretary Treasurer, J. Chester Bradley, Berkeley, Cal

The Executive Committee consists of the officers and the following fellows Wm M. Wheeler, New York, N Y, John B. Smith, New Brunswick, N. J., Herbert Osborn, Columbus, O, C. J S. Bethune, Guelph, Ont, F M Webster, Washington, D C and Chas W Johnson, Boston, Mass

Following the business meeting was a smoker at the Hotel Endicott given by the Newark, Brooklyn and New York Entomological Societies to the Association of Economic Entomologists and the Entomological Society of America.

The executive committee at a meeting held December 29th, decided to call a meeting of the society at Boston, Mass., in connection with the meetings of the International Zoological Congress in August, 1907. Fuller announcement will be made later.

The dues of the new society are one dollar a year and all persons *interested in entomology* in "The Americas" are invited to apply for membership. The membership now exceeds two hundred and fifty.

The American Association for the Advancement of Science granted affiliation to the new society at their New York meeting.—E. S. G. TITUS, *Secretary*.

A PARASITE OF THE MAPLE LEAF-STEM BORER, *Priophorus acericaulis* MAC GILLIVRAY.—In the November number of the NEWS, Dr. W. E. Britton in his account of the maple leaf-stem borer or sawfly, *Priophorus acericaulis* Mac Gillivray and its occurence in Connecticut, mentions the fact that this was undoubtedly the species found by Dr. J. B. Smith in New Jersey. This was the case and with us the insect was very local occuring on only a few trees in South Orange as may be seen by referring to the reports of the New Jersey Agriculture Experimental Station. Our experience with the insect was similar to that recorded by Dr. Britton, except that we did not breed out the adults. We did rear, however, some half dozen examples of a parasite not recorded as infesting this insect and not mentioned by Dr. Britton unless it is one he refers to as resembling *Pteromalus*. This was sent to Dr. Ashmead who determined it as *Sympiesis quercicola* Ashm. The parasites emerged on June 16.—EDGAR L. DICKERSON.

INSECTS GATHERING ON STRAW FLOWERS.—While in the vicinity of Bridgeton, N. J., September 11, 1906, my attention was called by the grower to a small patch of straw flowers which were infested with insects. This plant is a species of Compositæ and the flowers which are greenish in color, are used for winter decorations, etc. Upon examining the patch I found a number of specimens of *Tragidon coquus* Lec. many of which were in copulation. They apparently were not feeding but had gathered on the plants for the purpose of copulation. Besides these, a number of specimens of *Euphoria inda* L. and *sepulchralis* Fabr. were feeding upon the succulent stems of the plants and the sap or juice exuding at these injured places had attracted a few specimens of *Ips fasciatus* Oliv. Numerous insects of various orders were observed about the plants or on the blossoms and among them *Lebia grandis* Hentz, *analis* Dej. and *Brachyacantha 4-punctata* Melsh. resting on the leaves.

The plants were located in one of the rear fields of a rather sandy farm near woodland and owing to the absence of any other plants in bloom, at the time, in the near vicinity, formed the center of attraction for the numerous insects.

I requested the owner to send me such insects as he might find on the plants within the next few days and accordingly received a few more specimens from him. In all I obtained 46 samples of *Tragidion coquus* Lec.—all similar in markings, being black with red elytral spots—and a like number of *Euphoria sepulchralis* Fabr. and *inda* L. besides those species already mentained and several more of Coleoptera and other orders.—Edgar L. Dickerson.

Doings of Societies.

Meeting of the Cotton Belt Entomologists.

The annual meeting of the Association of Official Entomologists of the Cotton Belt was held at Baton Rouge, La., on November 13th and 14th, in the Agricultural Building of the Louisiana State University.

Entomologists from the North as well as the South were in attendance, the following States being represented: Louisiana, by Wilmon Newell, B. H. Guilbeau, C. W. Flynn, J. B. Garrett, M. S. Dougherty, Harper Dean, A. H. Rosenfeld and R. S. Howell; Mississippi, by Glenn W. Herrick; Alabama, by R. S. Macintosh; Florida, by E. W. Berger; Georgia, by R. I. Smith and W. W. Chase; Tennessee, by H. A. Morgan; Arkansas, by C. F. Adams; North Carolina, by Tait Butler and R. S. Woglum; New Hampshire, by E. Dwight Sanderson; Illinois, by S. A. Forbes; Iowa, by H. E. Summers, and the Department of Agriculture, by W. D. Hunter, W. Dwight Pierce, F. C. Bishopp and W. A. Hooker, of the Bureau of Entomology, and Cooper Curtice and B. H. Ransom, of the Bureau of Animal Industry.

In the absence of the chairman and secretary, Professor Wilmon Newell called the meeting to order and Professor E. Dwight Sanderson and W. A. Hooker were elected chairman and secretary, respectively.

Tuesday's session was devoted to a discussion of the cotton boll weevil. Mr. W. D. Hunter, in charge of the boll weevil investigations of the Bureau of Entomology, opened the meeting, giving an account of the progress made in the boll weevil investigations during the past year. He spoke of the factors, natural and artificial, that assist in the spread of the weevil; of the studies that have been made on the hibernation; the factors in its natural control and of the observations made on its habits in Guatemala by Mr. E. A. Schwarz, and its adaptation to local conditions in this country.

State Entomologist Herrick spoke on "Mississippi and the Boll Weevil Problem." He does not anticipate greater injury than Louisiana has experienced and proposes that the cultural methods be demonstrated in Mississippi by experimental farms and institute work. He stated that he was in favor of a law compelling the destruction of stalks before frost.

State Entomologist Smith, of Georgia, spoke of the attitude of the people and officials of the Eastern States to the boll weevil problem. He mentioned the interest which had gradually decreased in the last few years was now increasing as the weevil approaches.

Mr. C. W. Flynn, Assistant Entomologist of the Louisiana State Crop Pest Commission, gave an account of the recent changes in boll weevil quarantines in the Southern States and the status of quarantines at present in force. Concerning the situation in Louisiana, it was explained that the quarantine line is extended as made necessary through the dissemination of the weevil. In August, the quarantine in Louisiana was removed, but three weeks later replaced by a demand from the parishes, only cotton seed and seed cotton being quarantined against. Mr. Hunter cited a case, as bearing on the subject, where an infestation in West Texas was found to have been carried in cotton seed by a wagon to a distance of fifty miles. Prof. Herrick stated that in Mississippi quarantine regulations were erroneously omitted from the new code, and consequently that State now has no regulations against the importation of cotton seed from the infested districts. Dr. Adams, State Entomologist of Arkansas, spoke of the proposed quarantine laws of that State.

Mr. J. D. Garrett, Assitant Entomologist of the Louisiana State Crop Pest Commission, presented a paper on the areas covered by the 1906 migration in Louisiana. It has this year entered Arkansas and Indian Territory and is within twenty-five miles of the Mississippi line. He stated that 64% of the cotton producing area of Louisiana has now been reached as against 31% at the end of 1905, that in the northern portion of the State a forward movement of seventy miles had been recorded the present year.

Mr. W. Dwight Pierce, of the Bureau of Entomology, closed the Tuesday session with an exhaustive paper on the studies made of parasitism of the boll weevil. Mr. Pierce, during the past year, has made a study of the parasites of the Rhynchophora, especially of the boll weevil. He has found from the examination of many thousand infested squares that already in some localities in Texas they are an important factor in the control of the weevil. These he further found to have come from the native weevils, the prevailing parasite varying with the locality.

The Cattle Tick.

Wednesday, the cattle tick, the sole transmitter of Texas fever in cattle, came up for discussion, the session opening with Professor Summers in the chair in the absence of Professor Sanderson. Dr. Cooper Curtice, of the Bureau of Animal Industry, first addressed the meeting, telling of the work of eradication as now carried on by that bureau.

Mr. Malcomb B. Dougherty, Assistant Entomologist of the Louisiana Crop Pest Commission, followed Dr. Curtice, speaking on the results of studies made in connection with the life history at Baton Rouge.

Mr. W. D. Hunter then addressed the meeting and discussed the results of the cattle tick investigation and survey in Texas as carried on by the Bureau of Entomology. He reviewed the progress made in our knowledge of the biology of the tick, referring to Professor H. A. Morgan, who, through his studies of the life history, worked out the system of rotation which now makes eradication practicable. He spoke of the climatic factors which make eradication in the Gulf States quite a different problem from that along the present quarantine line.

Dr. Tait Butler, of North Carolina, who has already cleared no less than ten counties in that State, next addressed the meeting on the work that has been carried on under his supervision.

The many difficulties that arise in the work were mentioned and the ways in which they may be overcome were described.

The secretary read a paper reviewing briefly the study of ticks other than the cattle tick, their transmission of diseases as demonstrated by Lounsbury and others, describing the ticks that have been brought to light recently by the Bureau of Entomology and their biology so far as studied. Some species hitherto unknown in their country, that may transmit disease, were mentioned.

Professor H. A. Morgan, of Tennessee, closed the meeting with an address on "A Review of the Inception and Development of the Cattle Tick Eradication Movement." He discussed the work which brought about an appropriation by Congress for tick eradication. The speaker expressed his confidence in the possibility of complete eradication of the cattle tick through national aid and State co-operation. This he stated will open the stock markets of the North, and as a result stimulate the cattle industry of the South upon which its agriculture is based.

W. A. Hooker, *Secretary.*

At the meeting of the Feldman Collecting Social, held on the evening of November 28, 1906, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, Pa., twelve members were present, and Mr. Kaber, visitor. President Daecke in the chair.

Professor Smith said that the periodical cicada, brood 8, had been due in New Jersey this past summer, and that it had been sought for in different parts of the State, but that it had not put in its appearance. He further stated that our common "dog-day harvest fly" has been erroneously referred to *Cicada tibicen* L., and that it is not *tibicen* at all, and, furthermore, that there are four distinct species, where heretofore it had been supposed that there was but one. Three of these species can be recognized by their song, and they are all generally distributed throughout the State of New Jersey.

Mr. Harbeck exhibited his collection of the genus *Chrysops.*

Mr. Daecke also exhibited his collection of *Chrysops,* which represented all the species so far known from New Jersey, besides a number of species from other States. He spoke briefly on some differentiating characters of species in this genus. *Chrysops cursim* Whitney he said to be undoubtedly distinct. He handed in the record of *Chrysops sackeni* Hine, taken at Da Costa, N. J., June 3, 1906, as new to the State of New Jersey.

Mr. Laurent spoke about the importance of the "Entomological Society of America," which was discussed by the members and particularly by Dr. Skinner and Prof. Smith.

Dr. Skinner exhibited specimens of *Homoglaea carnosa*, taken at Luzerne County, Pa., and *Matigramma rubrosuffusa*, taken in the Huachuca Mountains, Arizona. The same speaker reported the occurrence in the past summer of *Tibicen septendecim* at Germantown, Philadelphia, Pa.

FRANK HAIMBACH, *Secretary*.

At the meeting of the Feldman Collecting Social, held on December 19, 1906, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, Pa., there were eight members present.

Mr. Bland exhibited a specimen of a supposed aquatic parasite, taken from an aquarium, in which the gold fish were dying, supposed to have been caused by the presence of this parasite.

Mr Wenzel spoke about the color variation in the genus *Phanaeus*, exhibiting specimens from Florida, Wilmington, N C, and Balsam Mountains. He pointed out that the Florida specimens are metallic-bronze, deeply striated, and those from North Carolina are dull green, the striæ hardly noticeable

Mr Harbeck recorded the following species of Diptera, new to the New Jersey list: *Sturmia normula* Van der Wulp, taken at Clementon, May 30, and Trenton, September 7. *Hypostena barbata* Coq., taken at Trenton July 7, also *Chaetona macroptera* Van der Wulp Habitat, Mexico, taken at Germantown, Philadelphia, Pa., May 21, 1905.

Mr. Daecke reported the capture of *Tabanus typhus* Whitney at Da Costa, on June 4th, as new to the State of New

Jersey. Mr. Daecke also exhibited a specimen of an *Ammophila,* mounted in a sleeping position, taken in this position in the evening at Willow Grove, Pa.

Mr. Haimbach exhibited specimens of a pink variety of *Haematopsis grataria;* also specimens of *Blepharomastix stenialis* Guen and *Geshna primordialis* Dyar, which two species had until recently been lumped in collections under the name of the former.

A paper on Insect Life in Florida Caves, by the late H. G. Hubbard, was read.

FRANK HAIMBACH, *Secretary.*

Minutes of the Brooklyn Entomological Society, Brooklyn, N. Y.

Meeting of March 1st, 1906. President Dr. J. L. Zabriskie in the chair and seven members present.

Dr. Zabriskie addressed the society on "Microscopical Examinations of External structures of Hemipterons Insects of Genera Anasa and Lygaeus." The remarks related chiefly to curious structures which are to be seen after suitable bleaching and microscopical mounting of dissections of the insect, and found in connection with the antennae, mouth parts, legs, pronotum, coxae and wings. The address was illustrated by thirty-nine lantern slides of his own preparation, which comprised etchings on sheet-gelatine, tracings of sketches through the camera-lucida, from microscopical mounts of his own dissections.

GEO. P. ENGELHARDT, *Secretary.*

Meeting of April 5th, 1906. The President Dr. J. L. Zabriskie presided with twelve members and one visitor present.

Mr. Robert W. Dougherty of Brooklyn, N. Y. was elected a member.

Mr. Franck read a paper announced under the title of "The Most Advantageous Method of Collecting in the Elevated Regions of Placer and Plumas Counties, California", illustrated by specimens. His point, that it is more advantageous to collect in one locality throughout a season, than to move about to different localities and altitudes, he showed by comparing the results of two collectors. Commencing at an altitude of 2500 feet he gradually worked up to an elevation of 6500 feet until June when he left for Plumas Co., where he collected at an altitude of 11500 feet. Of the three shipments received by Mr. Franck the second and third shipment represented for the greater part insects contained in the first shipment, the repetition of species showing a seasonal retardation corresponding with the altitude in which they were collected. About 200 species of lepidoptera were taken. The following insects were among those selected to illustrate the subject and were taken in all the localities and altitudes visited by the collector :--

Hepialus lenzi, *Axenus arvalis*, *Melicleptria villosa*, *Syneda edwardsi*, *Heliothis phlogophagus*, *Annaphila decia*, *Heliaca diminutiva*, *Hemaris thetis*, *Plusia californica*.

The second collector remained in one locality near Colorado Springs, Colorado, from May 15th to the end of August, and while his catch did not exceed in number of specimens that of the first collector, he secured 531 species.

GEO. P. ENGELHARDT, *Secretary*.

Meeting of May 3rd, 1906. The President Dr. J. L. Zabriskie presided with twelve members and one visitor present.

Prof. Smith, on behalf of the glossary committee, submitted a galley proof of the "*Glossary of Entomology*" for the inspection of members and reported that the book will contain about 150 printed pages and in addition several plates of illustration. The price per copy was voted by the society to be $2.00.

Mr. Chas. Westphal of Brooklyn, N. Y. was elected a member.

Mr. Roberts spoke on the waterbeetles belonging to the Haliplidae and he exhibited all the described species save one unknown to him and nine new species with manuscript names. In describing his methods for determining species he called particular attention to the shape and measuration of the front and middle tarsi of the males, which are simple in the females and are characters not heretofore used! Other characters mentioned were the markings on elytra, and the shape of the coxæ, plates and prosternal process and variations in the formation of the metasternum.

Mr. Roberts also explained his method of mounting small specimens of Coleoptera on card points. He recommended points not too finely tapered and the use of the best white shellac and highest proof alcohol. The specimens should be dry, the shellac applied thinly and the points bent slightly downward, so that one side of the specimen can be placed on the point, leaving the other side and middle clear.

Prof. Smith called attention to the 17 year cicada due to occur this year in some sections of New York and New Jersey and asked the members to report their observations.

GEO. P. ENGELHARDT, *Secretary.*

Meeting of June 7th, 1906. The Vice-President, Mr. E. L. Graef presided with eleven members and one visitor present.

Mr. Davis reported that at the joint field meeting of the New York and Brooklyn Entomological Societies on May 30th at Great Notch, N. J., fair collecting, beautiful weather and delightful scenery combined to make the day enjoyable to all participants.

Mr. Franck exhibited a crippled but living specimen of *Chelepteryx collesi* from Australia and the cocoon from which it had emerged. The wings of the moth had not expanded, thus showing more clearly the enormous size of its body. The large oval cocoon was constructed of coarse silk, bristling with with the stiff hairs of the caterpillar, which caused considerable irritation by adhering to the skin when touched.

GEO. P. ENGELHARDT, *Secretary.*

Meeting of October 4th, 1906. The Vice-President Mr. E. L. Graef in the chair and thirteen members and one visitor present.

Mr. Graef read a paper on "Reminiscences of some Brooklyn Entomologists." He spoke of the great difficulties experienced by him and his contemporaries, A. R. Grote and Frederick Tepper, in getting their specimens named when commencing their collections about fifty years ago, as then only few books on American insects were extant and very few people in Brooklyn were interested in Entomology. He dwelt on his acquaintance with Stephen N. Calverly, Herman Strecker, J. A. Lintner, Rev. John G. Morris, W. K. Morrison, W. V. Andrews, John Akhurst, and the genial Harry Edwards and in this connection mentioned many incidents of historic interest. The organization of the Brooklyn Entomological Society was chiefly effected by the efforts of F. G. Schaupp and Mr. Graef.

That Mr. Graef's interesting paper should be published in printed form was the sentiment of all members present.

Mr. Weeks exhibited specimens of the 17 year cicada collected in June at Yaphank, L. I., in the same locality where he remembers that they were exceedingly abundant in the year 1855, or just 51 years ago.

GEO. P. ENGELHARDT, *Secretary*.

Meeting of November 1st, 1906. The President, Dr. J. L. Zabriskie, presided with eleven members and one visitor president.

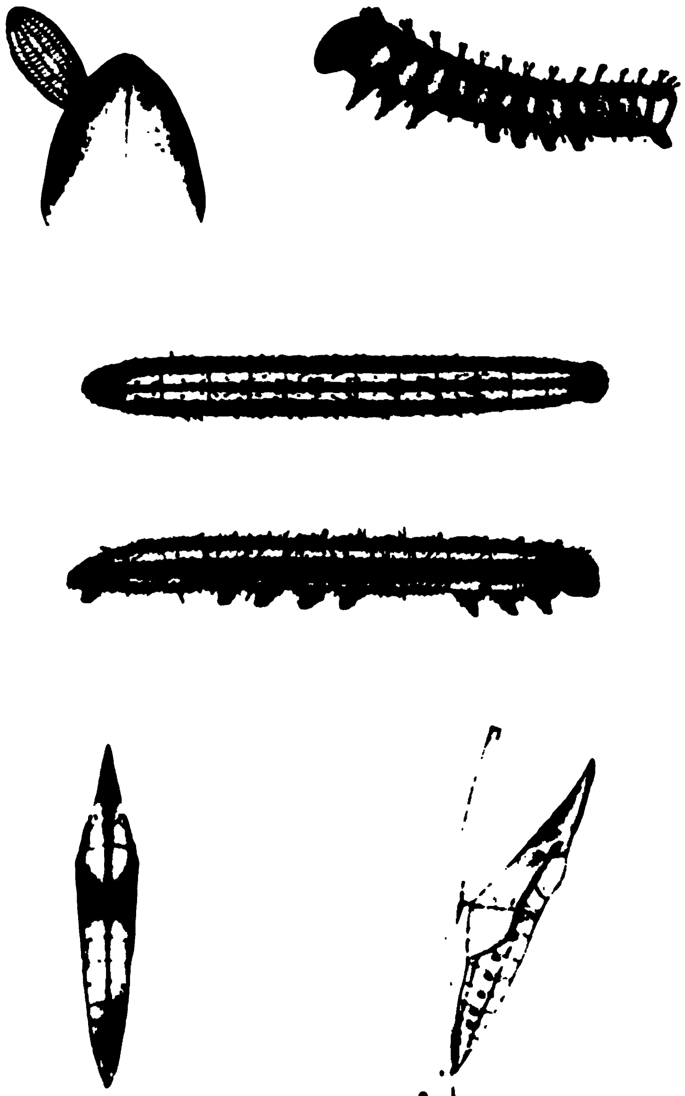
Following a report by Prof. Smith, the motion by Mr. Weeks was approved: that the report of the Glossary Committee be accepted, the recommendations adopted and the committee discharged with thanks. In recognition of valuable assistance in connection with the Glossary of Entomology, John Grossbeck, Dr. Folsom, Dr. Calvert, Dr. Skinner, Prof. Johnson, and Nathan Banks have each been presented with one copy. Mr. George Franck was appointed sales agent of The Glossary.

Frederic M. Schott, W. F. Bather and J. J. Levison, all of Brooklyn, N. Y., were elected members.

Some causes of the extraordinary increase of insect life and species in the vicinity of cities: (*a*) destruction of birds, (*b*) extensive variety of vegetation, as presented by Mr. Weeks, furnished a subject for general discussion by the society.

Mr. Roberts obtained *Hydroporus arcticus* from Hopedale, Labrador, the first record of this European beetle from North America.

GEO. P. ENGELHARDT, *Secretary*.



ANTHOCHARIS OLYMPIA EDWARDS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Life History and Habits of Anthocharis (Synchloe) Olympia Edw.

By CHARLES ALBERT SHULL, Lexington, Kentucky.

(Contributions from the Biological Laboratory of Kentucky Univ., No. 1.)

Thirty-five years ago William Henry Edwards[*] gave us the first description of *Anthocharis olympia* from specimens captured near his home at Coalburgh, West Virginia. Later, Strecker,[†] and Scudder[‡] also, gave accurate descriptions of the imago, in their works on butterflies.

This species was found to have a very broad range, being reported in most of the states from West Virginia to Colorado, and from the Northwest Territory in Canada to Texas. Notwithstanding its wide distribution, nothing was known concerning its preparatory stages for over twenty years. It was not until 1891 that Mr. Edwards captured a female in the act of depositing her eggs on a species of *Sisymbrium*. He watched the development of the larvæ and gave a very brief description of them in the supplement to his monumental work, "The Butterflies of North America," in 1897.[||]

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[*] Edwards, W. H., 1871.—Trans. Am. Ent. Soc., vol. iii, p. 266.

[†] Strecker, F. H. H., 1874.—Lepidoptera Rhopaloceres and Heteroceres, Indigenous and Exotic. p. 64. Pl. viii. Fig. 9.

[‡] Scudder, S. H., 1889.—Butterflies of the Eastern United States and Canada, vol. iii. p. 1844.

His description of the adult larva is fairly accurate, but the only specimen which attained its full growth died in pupation, and so our knowledge of its life history was left incomplete.

In the spring of 1905 my attention was called to the presence of *Anthocharis olympia* in the dune region about the southern end of Lake Michigan. During the past season it has been possible for me to study the complete life history and the habits of this extremely interesting butterfly, both in its native habitat and in the laboratory. The locality studied lies between Clarke Junction and Pine, Indiana.

The first collecting trip to that region was made April 28, 1906, and a number of specimens were captured, all of them being the typical *A. olympia*, as figured by Edwards,[§] although some of them show a larger "white interior patch" on the forewings than the one figured from Whiting, Indiana.

It was found to alight almost exclusively upon the flower clusters of *Arabis lyrata* L., the only Crucifer which can be found in bloom at this early season in the dune region. A second visit was made May 12th, and more adults were captured, but none of them seemed to be ovipositing. Being firmly convinced that *A. lyrata* was the food plant, I made a careful search, and, after a great many had been examined, was rewarded by finding a few eggs.

Edwards describes the eggs as red. If they are red when first laid, they must turn orange yellow as development proceeds, for every egg seen was of this color. The eggs are laid singly, usually only one, and very rarely more than two, upon a single plant; and in this case the eggs may have been laid by different females. They are nearly always placed on the sepals of the younger, centrally located buds, rarely on the

[||] Edwards, W. H., 1897 The Butterflies of North America, vol iii Supplement, p 2

[§] Edwards, W. H., But of No Am, vol. iii. Pl. 2 Anth. Fig 5 peduncle just below the bud. Fig. 1 shows the usual situation of the egg.

It is important to the young larva that these young central buds be chosen rather than the outer ones which bloom first. For the sepals of *A. lyrata* are caducous; and if the eggs were placed on the older buds, the sepals would fall before the egg hatched, and the young larva would die of starvation. This happened in one instance in the laboratory.

Just before the egg hatches, it changes from orange yellow to a dull yellowish brown. The larva, measuring a little over 1 mm. in length, eats away one side of the shell, creeps out, and usually begins to feed at once, leaving the shell as when it emerged. My observations on this point are at variance with the statement commonly made, that butterfly larvæ devour the shells from which they emerge before beginning to feed upon the food plant.

The duration of the instars varies with different individuals, and the moults occur more rapidly indoors than out, especially if an abundant food supply is kept on hand. The larva watched most closely as regards the time of moulting, hatched on May 13th. The first moult occurred at 9.30 A. M., May 16th; the second on the 18th, the third on the morning of the 20th, and the last early on the 22d. The adult larva, 28 mm. in length, left its food plant near noon on the 25th, and began to crawl about on the sides of the bell jar which was kept over the vessels containing the food, as if seeking a suitable place for pupation. It continued this for more than four hours, and then became very quiet. At six o'clock it was spinning the silken carpet on which they always pupate, and a half hour later it had begun the "button" to which the posterior end is finally attached.

It is interesting to note that this mass of silk is nearly always spun while the larva hangs head downward. There seems to be a geotactic stimulus of some kind, for in one case the larva was carefully inverted four times successively after the carpet had been spun, and each time after about ten minutes it turned slowly around without leaving the web already spun, and assumed this inverted position. After turning the last time it began to spin the button of silk, and then, although its position was reversed, it continued spinning for an hour, and finally attached itself.

After the spinning was completed, the larva turned slowly around and felt about carefully with the posterior end until it came into contact with the mound of silk, when, with a deft motion, the hooks of the anal prolegs were inserted and twisted firmly into it. Thus it is seen that the stimulus which impels the reversed position during the spinning really anticipates an upright position for the pupa.

After a short period of rest the larva began to spin its girdle. This was accomplished exactly as by *Pieris rapae* L. The head and thorax are bent sharply backward and the thread is attached at one side of the body. Keeping the anterior end in this flexed position, it carries its head by torsion to the opposite side, where the thread is again attached. Back and forth it keeps spinning, strand by strand, until the girdle is strong enough to support the pupa properly. Two specimens were observed, and the one spun 24 strands, the other 33.

Thus the girdle spans twice the diameter of the body, and perfect allowance is made for the increased diameter of the pupa. When the spinning of the girdle is completed, which takes from 20 to 25 minutes, the head is slowly and carefully withdrawn from the loop of silk. On the following day, May 29th, about 3 P. M., the pupa emerged.

The entire larval period, then, is from 12 to 14 days in the laboratory, some growing faster, others slower, than the one described above. But in the field the period seems to be longer. On May 12th no larvae were to be seen on any of the food plants, and on May 29th, the same day pupation occurred in the laboratory, the larvae in the field were in all stages from the second to the beginning of the fourth instar. Assuming that other eggs of the same age as those collected were left in the field, the larval period must be several days longer than in the laboratory. Probably this can be accounted for by the cooler nights and less abundant food in nature, both of which would tend to decrease metabolic processes and so increase the length of the larval life.

The color changes which take place during this larval and early pupal life are very remarkable. Eggs sectioned at the time they turn brownish are found to contain a fully formed larva. The body is doubled up in the egg with the ventral surfaces together, the head lying next to the micropyle.

At birth the larva measures less than 1.5 mm. in length. The body is lemon-yellow with grayish tubercles bearing large glandular hairs, just as in other Anthocharid larvæ. The head is very dark, and before the first moult, becomes a shiny jet black.

After the first moult the head is no longer black, but greenish gray, and the whole body becomes green, due, perhaps, as Poulton* suggests, to transformed plant pigments. Before the end of the second instar the longitudinal stripings begin to show. There is a grayish-green median dorsal line; then on each side, a subdorsal light yellowish-green line, a lateral gray-green line, and a narrow infralateral yellow-green line bebetween the spiracles and the base of the prolegs. The ventral surface and legs are grayish-green.

During the third instar the colors as described by Mr. Edwards are fully developed. The dorsal and lateral lines become slaty in hue, shading out into green which merges into the yellow of the subdorsal line. The infralateral line becomes pure white beneath the spiracles, and a very narrow light-yellow line lies just below the white.

In the fourth and early part of the fifth instar these colors do not change except to become brighter and more contrasted. The dorsal and lateral slate-green lines are certainly correlated with physiological processes, for they lie exactly peripheral to the dorsal and lateral blood vessels, which may be seen pulsating beneath them if examined with a hand lens. As the last instar is nearing its end, the brilliancy of the color pattern is lost. The green becomes ashy gray-green, and the yellow portions turn olive and are somewhat reduced in size.

Shortly after this a peculiar purplish tinge makes its appearance at the posterior end and about the thorax. This

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*Poulton, E. B., 1893.—Experimental Proof that the Colors of certain Lepidopterous Larvæ are largely due to modified plant pigments derived from the food. Proc. Roy. Soc. of London, vol. liv., pp. 417-430.

purplish color gradually extends anteriorly until the whole body shows it. This change immediately precedes and accompanies the wandering of the larva while seeking a place to pupate. The color becomes very dark, and by the time the larva has spun its girdle, every trace of green has disappeared from the body. The dorsal and lateral green stripes, the ventral surface and the head are all very dark bluish-purple. On close observation the traces of the subdorsal yellow lines can still be seen. The infralateral line of white remains very brilliant, and is accompanied by a trace of the yellow; but it no longer extends the whole length of the larva. It is interrupted in the second and third thoracic segments, which become swollen and turn purple as the wing rudiments develop beneath the old cuticle.

As pupation approaches, the color lightens somewhat, and when the pupa emerges it is a beautiful rosy purple, with a white infralateral line extending from the tip of the wing to the tip of the abdomen. A short time before pupation takes place, very slight peristaltic contractions begin in the abdominal region, passing anteriorly. These contractions probably serve two purposes: to loosen the old cuticle, and to distend the anterior portions of the body where the rupture of the larval skin is to take place. The weak contractions give way to very strong peristalsis just as pupation commences. The old cuticle ruptures over the thorax and down the median line of the head, and is soon cast. As a last act the anal segment is withdrawn from the old skin, and the cremaster is thrust into the button.

The beautiful color of the pupa does not last long; within a few hours the rose-purple fades, being reduced to various shades of brown.

Since no account of the pupa has ever been given, a more detailed description might be appreciated. In profile the dorsal line is almost straight, being but slightly concave just over the wings. The average length is 18 mm.; the greatest width, 3 to 3.5 mm. at a point 6 mm. from the anterior end; the greatest depth is 3.5 to 4 mm. about 9 mm. from either end. Figures 5 and 6 show the general shape of the pupa.

When the final color change occurs, the dark anterior region becomes dark brown; and the most important elements of the color pattern are longitudinal dark lines, of which there are five usually well marked: a median dorsal, two laterals, and two which lie more ventrally to either side of the median ventral line. The latter is marked by only a few dark dots back of the apices of the wings. The paler dorsal areas lying between these darker lines are marked with small black dots which seem to occupy the same relative position on the segments as the black tubercles on the larvæ. See Figures 2, 3 and 4. The wing cases also bear dots lying in rows exactly above the veins of the wings, and a submarginal row between the veins. The antennæ are also outlined by rows of minute dots.

Experience has shown that there is considerable variation in the minute markings of both larvæ and pupæ, and more detailed accounts are of little value for this reason.

The habits of the imago and the full-grown larva in their native habitat are worthy of careful study wherever this interesting species may be found. The species is monogoneutic, and the butterfly is on the wing from early in April to the end of May, depending on the season. Thus the pupal life extends over a very long period.

The conditions of life are extremely rigorous in this region. The temperature extremes of summer and winter are excessive and subject to great and sudden changes; the relative humidity is low, even as low as 30 per cent. at times; the sand blast is strong enough to erode the standing trunks of dead trees; and enemies, such as tiger-beetles and ants, abound. It is therefore of interest to learn where in such a region the pupa would spend ten months of the year.

On May 26th a number of half-grown larvæ were located, and on June 1st the region was visited again. Most of the larvæ had disappeared, but at one of the stations a single larva remained. It was already purplish, which indicated that it was ready to leave its food plant. Carefully removed from the plant to the ground it was allowed to go whither it would. It crawled along usually on some plant stems a few inches above the ground. In that way it avoided the unpleasant heat of the sand (which was very often found to be above 40° C.), and also any tiger-beetles that might have been lying in wait.

After a short time it entered a clump of the bunch grass, *Andropogon scoparius* Michx., which is very abundant in this region. The grass clump was about a foot in diameter, and the larva clambered about in it, up and down and back and forth for nearly six hours. Finally it became quiet and began to spin its scala or carpet of silk just a couple inches from the ground, in the midst of the grass. I was compelled to leave it at this point; but on the next visit, June 9th, the pupa was found in the same situation, head upward.

Many similar clumps of *Andropogon*, *Elymus*, and other dune grasses were searched carefully for other specimens, but it was like hunting for a needle in a haystack, since the grass clumps are very numerous and the pupæ relatively rare. No others were found.

However, this may be taken as a probably typical habitat. And certainly none could be found better adapted to a long quiescent existence. *Andropogon* retains its dead leaves and stems the year round, the new ones growing up through the old ones. The excessive heat of summer is mitigated by the shade of the leaves, protection from the winter cold is secured in the same way, the humidity of the atmosphere is somewhat more constant in such a situation. The dune grasses are noted for their ability to stop the sand blast and form embryonic dunes about their bases wherever the sand is shifting. And the love of tiger beetles for open sand is well known. It is an admirably chosen location.

The habits of flight of the imago are very interesting. It flies near the ground, following a rather uncertain course, dancing tremulously this way and that. It requires but a few moments' observation to note, however, that the direction of movement is determined largely by mechanical factors. Even in a gentle breeze, the butterfly, no matter how irregular the course of flight it may pursue, exhibits a strong positive anemotaxis, nearly always alighting on the racemes of its food plant with its head toward the wind, or at a very slight angle to it. The reason for this is perfectly obvious. It assumes the position in which it offers the least resistance to the wind, in which it needs to exert no muscular effort to keep its wings folded, and in which the muscular effort of flight is exerted symmetrically. Occasionally a butterfly would attempt to turn away from the wind while resting upon the clusters of flowers; but it was unable to maintain this position. The wind would either shift it back again, or blow the wings forward over its head, thus rendering the insect helpless.

On .May 12th I was able to observe their flight in the face of a gale. It was a bright, hot afternoon and the wind was blowing at the rate of from 45 to 50 miles per hour. Since *A. olympia* is a weak flier, it could not face a blast like this. The wind swept directly across the crests of the low sand ridges, and the only place that specimens could be found at all was on the leeward sides of the dunes, or immediately behind protecting groups of willows and pines which are often found in the moist depressions between them.

Protected thus from the direct force of the wind, the butterflies were seen pursuing an irregular course, dancing from side to side, but always headed toward the wind, and making slow progress toward the crests of the dunes. This advance was continued until the crest was reached; but no sooner had one reached this point than it was caught in the wind and hurled backward and downward by the eddying blasts, to begin anew the ascent of the leeward slope. This process was observed again and again.

It is not hard to find in this mechanically determined flight a great advantage to the insect. Flight toward the wind tends to keep it within the limits of its habitat. The enforced retrograde movement is counterbalanced by the progress of the butterfly toward the wind. If it flew with the wind, either it would be blown inland, far away from the habitat of its food plant, or it would perish in the waters of Lake Michigan.

The habits described above depend, no doubt, upon structural characters, and do not owe their origin to natural selection; for it is recognized that natural selection can be exercised only upon such structures and habits as already exist. The structural characters which condition the habits may have arisen by mutation or by any other process by which heritable modifications may arise. Having arisen, and being adapted to the needs of the insect, the structures and consequent habits will be preserved by selection. For, if certain specimens by mutation should become still weaker, they might be blown from their restricted habitat, and so perish. If, on the other hand, they should become stronger, so as to attempt to fly with the wind, the same fate would befall them. If the assumptions here made are correct, the habits of the imago are probably preserved by the destruction of those individuals which depart from the most nearly adapted condition.

It is to be hoped that others who live in regions where *Anthocharis olympia* is found will observe the habits and history, and note the variations which a different environment may bring about.

* * *

A new Variety of Thecla damon.

By H. H. Brehme, Newark, N. J.

Almost every collector in Newark, and even in New York and Brooklyn, knows, when he wants specimens of *Thecla damon*, to go to Garret mountains at Paterson, N. J., for this species. I have myself collected this insect for a number of years past, and have taken over a thousand examples, mostly of the spring brood, though also some of the summer brood. All of these specimens were of the usual bright fulvous color with dark borders, and none showed any tendency toward a black variety such as is described below. Scudder, in his Butterflies of the Eastern United States and Canada, mentions having a single specimen from Long Island. It is apparently a good variety, there being no intermediates, so I propose the name *patersonia* for it in order that it may be hereafter referred to by name, *Thecla damon* Cram. var *patersonia*, nov. var.

Of the same size as the usual form, upper surface of both pairs of wings even blackish-brown, with a very few scales scattered over the primaries and several near the anal angle of the secondaries; basal half of inner margin of secondaries paler than rest of wing, beneath as in the normal form. Type: one ♀ from Paterson, N. J., dated July 25, in the collection of the writer.

The specimen was bred by Mr. J. A. Grossbeck from larvæ of the spring brood which were found on red cedar.

Insect Hunting as a Pastime.

By G. A. Akerlind, Chicago, Ill.

Last summer I had occasion to stay in St. Louis, Mo., during the months of August and September, and as I was a stranger in the city, and there was "nothing doing" particularly, I devoted my evenings to insect hunting in the streets, and my Sundays to roam the woods for butterflies and the like. I had previously become interested, through some Chicago friends, in the entomological section of the Academy of Science, but I had not taken up the "sport" in earnest until my St. Louis sojourn, of which I should like to say a few words.

It takes some little experience to appreciate what it means to live in a hotel in the business section of a large city during the hottest season of the year, particularly so if you are not a "traveling man," and therefore pretty certain to have only yourself for a companion. The heat prevents you from pursuing any studies indoors, and out of doors—well, there you are hunted by insects. Consequently, I took up insect hunting as a pastime, but after a few evenings' "work" it became a sport with such pleasant and recreative effect that I am sorry that I did not take it up twenty years ago. In hunting and fishing you are generally confined to certain localities, but in insect hunting during the summer, it is not so, at least not in St. Louis, where the "game" is waiting for you outside your door and even in your bedroom.

Through the kind assistance of an old German jeweler near my hotel I rigged up the necessary killing bottles, and that was the only equipment needed for a start. This venerable German, by the way, came to St. Louis in 1856, when that city was the peer of Chicago and believed to be destined to remain so forever, which is very queer to contemplate for a modern Chicagoan. I had observed that the electric lights in front of the large store windows were hung unusually low, about eight feet, and a great abundance there were. This, I figured, would be favorable for bug hunting. The first clear evening I started out on an expedition and had not walked far before I came across a rather large bug sprawling on its back in its efforts to come on right keel. I had before this learned not to fear any bug (except the electric *Belostoma americana*), and I therefore unhesitatingly pounced on this one and had him in the bottle in less time than it takes to tell it. I bottled quite a few that evening, and after a tramp of some four or five miles up and down the streets I retired to my hotel and had a night's solid sleep.

The next morning I was curious to see what I had found during my initial expedition. There were the common large ground beetles and a number of smaller ones, but there was one with an elegant form and a dark blue border around the elytra. This beetle, the *Carabus sylvosus*, we do not have in Chicago, at least I have never found it there, and I felt very much encouraged to continue the hunt. Almost every evening I found something new in the way of insects, besides seeing interesting things that ordinarily escape our notice.

After the day's work in the office I never had to wonder how I would spend the evening. After supper and a perusal of the newspapers I would start out about 8.30 o'clock on my hunt, returning about 10.30 with my "game." This period appeared to be the best, as I seldom found anything before 8.30 or after 10.30. The people on the street did not bother me much. Nobody knew me and I did not know anybody. The policemen appeared to be about as scarce in St. Louis as in Chicago, and if they noticed anything queer about my actions they apparently considered me harmless. But one evening I very nearly got into trouble. As I walked along I perceived on the pavement a moving object in the uncertain light of the reflection from an electric light. "What is that? that is a funny kind of grasshopper! You must have been too close to that electric light," I thought. In stooping down the "grasshopper" appeared to me to have a strange resemblance to a giraffe, and when I cautiously grabbed for the wings the head was quickly turned around and I received a smart little bite that did not particularly hurt, but which completely took my nerve for the moment. At the same time it aroused my hunting passion to its highest pitch. I fell on my knees, buffeting the fierce little monster with one hand, while I pulled out my handkerchief with the other, and after a great bustle I finally succeeded in getting him securely enveloped.

When I arose there was a crowd standing around, apparently at a loss to make out what was the matter, but as I walked briskly away and probably appeared sane, no one molested me. I went straight to my hotel and put the captive with handkerchief and all in a fruit jar previously loaded for butterflies, and spent the next hour pondering over what kind of an insect I had found. A grasshopper does not turn his neck around and bite, at least not those I have come across, neither does a locust or dragon fly, or anything in that line. Cautiously opening the handkerchief, out fell a beautiful specimen of praying mantis, *Mantis religiosa,** which I had seen pictured in books, but never found before. That I was proud of this evening's catch goes without saying, and it is also certain that my anticipation for the future was considerably freshened. I did not succeed, however, in encountering any more such lively prey on the pavements of St. Louis, and I will therefore leave the "bugs" for the present and relate something of my butterfly hunting expeditions.

By experience I have learned that a hat is a poor instrument for catching butterflies, and I therefore bought a frame for a landing net in a sporting goods store, and a piece of netting, the name of which I do not know in a dry goods store. Needles and thread have been part of my bachelor equipment for the last quarter of a century, and soon my fly-net was completed. With the assistance of my old German friend I had made a powerful killing bottle of a fruit jar that just fit into my coat pocket, and Sunday morning, bright and early, I started out on my first trip. Anyone visiting St. Louis in the summertime should not fail to take an electric car ride to Creve Cœur Lake (The Bleeding Heart) about thirty miles from the city. The cars are open, the road absolutely dustless, and the speed up to forty miles an hour.

**Stagmomantis carolina.* Eds.

The double track runs through a most beautiful country, with wooded hills and valleys, fruit gardens and cornfields. Small colonies formed by city people are rapidly growing up along the line, and at the terminal, Creve Cœur Lake, improvements are constantly being made to increase the attractions of the place. The electric road ends on top of a "bluff" about 250 feet, I should judge, above the Creve Cœur Lake. The plateau is only a few acres in extent, but on both sides are other "bluffs" with deep ravines between them and below the lake shore, with all the attractions customary to such a place. The scenery from the bluffs is truly grand and passes my ability to describe. The vegetation is rich and varied. On the bluffs oak, elm, walnut and hickory, and on the bottom land immense cottonwood trees and sycamores. Of weeds and grass there was an abundance, as well as of blackberry bushes and burning nettles; in fact, some parts of the limited area of the woods, I traversed were well-nigh impossible to penetrate. A scaly lime rock formation formed the "bluffs," and towards the lake the rock cropped out, forming walls of considerable height, with water trickling out between the layers forming cascades, or rather suggestions of such. Viewed from the lake the hills had the same appearance as those along the Mississippi River, and it is quite evident that Creve Cœur Lake is formed by the river, and, I was informed, is yet filled to overflowing at times when the river is unusually high.

About 9.30 that beautiful Sunday morning I arrived at my destination, and had hardly ordered my breakfast when a fine *cresphontes* came sailing along not ten feet from the table. A hurry-up warning to the waiter was the first effect, and when a few minutes later a beautiful *Papilio ajax* came almost within striking distance I forgot what little I know of table manners and finished that breakfast in "no time." In a few minutes I was out in the woods with the net ready for action. Ha! There is a *cresphontes,* but how high he flies! and there is the *Papilio ajax,* but how he is diving and criss-crossing! I might as well try to chase a sparrow with my net as that fellow. But watch! He is coming this way! A wild "strike" sent me sprawling in a bed of burning nettles, but what did that matter? In the net was fluttering a real *Papilio ajax,* the first one I had seen at such close quarters, and not willing to take any chances by "bottling" in the usual way, I pressed his thorax between my fingers and then I could plainly feel his heart beat,—or perhaps it was mine! "Unmanly?" Well, yes, perhaps.

A good many things a man does at times can hardly be called "manly" or "noble," but will, nevertheless, make an impression upon his mind more lasting, and I may say, more recreative than "big" deeds, like stopping a runaway horse or licking a tramp.

It is now a year since I caught my first *Papilio ajax* and *cresphontes,* but how many times during this past year have not the incidents been gone through! How vividly have I seen the blue sky, the majestic trees and the many-colored flowers, heard the soft winds, the harmonious songs of the beautiful birds, and above all as centers of attraction, the butterflies, the winged and non-winged creatures that make up the insect world! Is not this true recreation for the business man, the engineer and all "intellectuals" in general, as well as for the man in the humblest calling? It is a happy sign of the time that nature study is coming more and more to the front, and any one who has taken up any branch of this study and pursued it far enough to get a real interest in it, will surely agree with me that it is as healthy and as inspiring a form of recreation and pastime as can be well enjoyed by the average man.

This tale has already grown too long, and I will only mention that Horse Shoe Lake on the Illinois side of the river is another locality near St. Louis worth visiting, besides all those of which I do not know anything. A partial list of specimens I found in St. Louis and vicinity last summer and a few I found there this summer during a short stay is given below, as determined by my friend, Mr. Emil Lilejeblad, a veteran insect hunter, and will show, I hope, that insect hunting as a pastime is a success, at least in St. Louis.

LIST OF SPECIES TAKEN:

COLEOPTERA.

Cicindela repanda.
" *punctulata.*
" *macra.*
Carabus sylvosus.
Calosoma scrutator.
" *sayi.*
" *callidum.*
Panagaeus fasciatus.
Pterostichus femoralis.
Dicaelus splendidus.
Lebia grandis.
Harpalus vulpeculus.
" *caliginosus.*
Anisodactylus baltimorensis.
Dineutes vittatus.
Hydrocharis obtusatus.
Silpha surinamensis.
Staphylinus maculosus.
Megilla maculata.
Coccinella sanguinea.
Monocrepidius lividus.
Megalodacne fasciata
Alaus oculatus
Chauliognathus pennsylvanicus.
Lucanus dama
" *placidus.*
Canthon chalcites
Choeridium histeroides
Copris minutus
" *anaglypticus*
Trox scabrosus
Pelidnota punctata
Ligyrus gibbosus
Allorhina nitida
Chrysochus auratus
Chrysomela scalaris
Diabrotica 12-punctata
Epicauta puncticollis
Epicauta vittata.
" *cinerea.*
Pyrota engelmanni.

LEPIDOPTERA.

Iphidicles ajax.
Papilio turnus.
" *troilus.*
" *cresphontes.*
Laertias philenor.
Eurema nicippe.
" *lisa.*
Charidryas nycteis.
Phyciodes tharos.
Polygonia comma.
Thymelicus taumas.
Enodia portlandia.
Sphinx plebeja
Haploa lecontei.
" *militaris.*
Leptarctia lena.
Apantesis virgo.
" *parthenice*
" *figurata*
Schinia arcifera.
" *brevis*
Tarache aprica
Catocala obscura
" *palaeogama.*
Eupsyche M-album
Thecla edwardsii
Achalarus lycidas
Thorybes bathyllus
Pholisora catullus
" *hayhurstii*
Hesperia tessellatus
" *centaureae.*
Hemaris axillaris.
Epimecis virginaria.

Standards of the Number of Eggs Laid by Insects—V.*

Being averages obtained by actual count of the combined eggs from twenty (20) depositions or masses.

BY A. ARSENE GIRAULT.

6. STAGMOMANTIS CAROLINA Linnaeus.

No.	Date, 1906	No. counted per mass	Successive totals	Av. per egg mass	Max.	Min.	Range	
1	Nov. 25	109	109	109.			115	
2		64	173	86.5				
3		49	222	74.		49		
4		87	309	77.3				
5		82	391	78.2				
6		89	480	80.				
7		91	571	81.6				
8		95	666	85.8				
9		96	762	84.7				
10		100	862	86.2				
11		115	977	88.8	115			
12		105	1012	84.3				
13		93	1105	85.				
14		91	1196	85.4				
15		105	1301	86.7				
16		87	1388	86.8				
17		110	1498	88.1				
18		86	1584	88.				
19		90	1674	88.1				
20		98	1772	88.6			49	
20			1772	88.6	115	49	66	Finals

The egg-masses were collected at Myrtle, Ga., November, 1906, from peach trees. They were found to be freely parasitized by *Podagrion mantis* Ashmead, which was found ovipositing into them during the month of November. Owing to the peculiar construction of the case, in order to count the individual eggs in each, they had to be sectioned longitudinally through the side, and then dried. Some of these sections exposed quite large larvæ of *mantis*, and occasionally living adults. The eggs are quite common in this locality.

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PROF. M. J. ELROD of the University of Montana is giving considerable attention to photographing Indians in his part of the world.

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* For the first four of this series, see ENT. NEWS, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; and 1906, p. 6.

Notes on Bombinae, with Descriptions of New Species.

By H. J. FRANKLIN, B. S.

Massachusetts Agricultural College, Amherst, Mass.

Bombus nigrodorsalis n. sp.

♀.—Length, about 19 mm.—Labrum sulcate in the middle. Clypeus rather smooth and shining, very delicately and sparsely punctate over entire surface except the corners. Malar space distinctly longer than it is wide at the apex; about one-third as long as the eye. Third antennal segment somewhat longer than the fifth; fifth distinctly longer than fourth. Ocelli normal and placed near the supraorbital line, above the narrowest part of the front. Hypopygium without median carina. Head with face, occiput and sides behind the eyes all black except for a very slight sprinkling of light hairs, visible with a lens, above the bases of the antennæ. Labrum fringed on free edge with yellowish fulvous hairs.

Thorax with pleura covered with light yellow pile from the tegulæ to the bases of the legs, the yellow on the two pleura being connected by a rather narrow band of the same color which crosses the dorsum of the thorax in front. This yellowish band does not nearly extend back on the middle of the dorsum to even with the tegulæ, but its posterior border is curved forward strongly from them on each side. Metanotum with a mere fringe of yellow pile behind. Otherwise the thoracic dorsum is entirely covered with black pile, there being, however, a very small bare spot on the center of the mesothoracic disc.

Abdomen above with the three basal segments entirely and rather densely covered with bright yellow pile; fourth segment entirely black and bearing black pile; fifth segment clothed with black pile, except its apical margin, which bears dull fulvous hairs; sixth segment dull fulvous and fringed with pile of the same color. Ventral surface of abdomen black toward the base, but with the hair which thinly fringes the apical margins of the second, third and fourth segments light yellow; hair fringing the apical margin of the fifth segment and the entire sixth segment dull fulvous.

Middle and posterior coxæ bearing some yellow hairs. Hind femora entirely black, with no light or yellow pile. Anterior and middle femora and tibiæ all black and without light pile. Some of the hairs fringing the corbiculæ behind tinged with fulvous. Wings somewhat stained with brown.

♂. Length, about 12½ mm. Like the ♀, except in point of size, but the corbicular fringes are entirely black and the pile of the apical abdominal segment and the apical fringe of the fifth segment are much less strongly fulvous than in the ♀.

Described from one female, and one worker (cotypes) in the collection of the U. S. National Museum. Five female paratypes and one worker paratype are also in that collection.

Subspecies *laticollis.*—♀.—Like the typical *nigrodorsalis* except that the band of yellow pile running across the anterior part of the dorsum of the thorax is much wider and reaches back in the middle to even with the tegulæ. Middle and hind coxæ and bases of posterior femora within bearing considerable yellow pile. Posterior fringes of corbiculæ strongly fulvous.

Described from one female (type) in the collection of the U. S. National Museum.

Specimens collected by C. H. T. Townsend in Meadow Valley head of Rio Piedras Verdes (6 miles south of Colonia Garcia). Sierra Madre of Western Chihuahua, Mexico—about 7,000 ft. alt.

Some of the specimens of this species have the coxæ and posterior femora, as well as the fringes of the corbiculæ, all black. The coxæ of the workers sometimes bear yellow hairs and their corbicular fringes are sometimes tinged with light or fulvous color.

This species may prove to be only a variety of *B. weisi* Friese, which in turn is possibly only a form of *B. ephippiatus* var. *laboriosus* Smith, but, if this is the case, then certainly *laboriosus* Smith and *pulcher* Cresson should not be included as varieties of the same species, as they are listed by Dalla Torre on the authority of Handlirsch. *B. nigrodorsalis* ♀ has a distinctly longer malar space than has *B, pulcher* ♀, and this is an exceedingly constant specific character in *Bombus.*

Bombus haueri Ant. Handlirsch.

♀.—Length, about 23 mm.—Malar space somewhat wider at the apex than it is long. Clypeus rather strongly punctate. Third antennal segment fully as long as the fourth and fifth taken together. Ocelli large, placed below the supraorbital line, in the narrowest part of the front. Hypopygium without median carina. Head with face, occiput and sides behind the eyes all black.

Thorax with anterior part of dorsum and the metanotum densely covered with deep yellow pile. A broad band between the bases of the wings and the pleura from the level of the tegulæ to the bases of the legs densely black and covered with black pile. The black band between the wings slightly more than one-half as long (from front to rear) as broad (from wing base to wing base). Tegulæ completely surrounded by black pile.

Abdomen above, with the first two segments densely clothed with yellow pile and the remaining segments covered with rich deep fulvous pile. Ventral surface of abdomen black, except toward and at the apex, where the segments are quite heavily fringed, especially on the side margins, with deep fulvous pile. Coxæ, trochanters, femora, and tibiæ all black and bearing no light pile; corbicular fringes black Tarsi more or less light brown ferruginous. Wings dark, as in *B. crotchii* Cr.

☿.—Length, 17 mm.—Like the ♀, but smaller. Tegulæ not entirely surrounded by black pile, but reached by yellow pile in front. Third antennal segment scarcely equal in length to the fourth and fifth taken together.

♂.—Length. 17½ mm.—Eyes greatly swollen, bulging out from the sides of the head. Ocelli large and placed far below the supraorbital line. Malar space very short, not much longer than the pedicel of the antenna. Antennæ with third segment fully as long as the fifth, the fourth much shorter than either.

Head black, but with face below the bases of the antennæ rather strongly yellow, black hairs, however, being intermixed. Sides of head behind the eyes black. Occiput rather weakly covered with yellow hairs.

Thorax with pleura covered with yellow pile to the bases of the legs. Dorsum of thorax entirely and densely covered with yellow except for a broad but rather indefinite (due to the intermingling of the yellow hairs) black band between the bases of the wings.

Abdomen above with first three segments covered with dull tawny yellow pile The remaining segments shading off toward the apex of the abdomen into rich fulvous. Abdomen beneath black at base, but, beginning a little behind the middle, the apical margins of the segments are fringed more or less heavily, especially toward the side margins, with fulvous hairs Coxæ and femora all black. Tibiæ and metatarsi all black, except their points and the inner sides of the metatarsi, which are light brown ferruginous, as are also the remaining segments of the tarsi

Locality labels of specimens as follows:

Mexico City, 1 ♀; Mexico, 1 ♀; Eslava, Mexico, 1 ♂; Meadow Valley, Mexico (C. H. T. Townsend, Collector), 1 ☿. The ☿ and ♂ of this species have not been heretofore described. The types (☿ and ♂) are deposited in the collection of the U. S. National Museum. The ♂ type is not in good condition, the pile of the abdomen being matted.

Were I to follow Robertson and recognize the genus *Bombias,* I should include this species under that genus. For certain reasons, which I hope to give in full in a later paper, however, it seems to me that *Bombias* should not be given more than subgeneric rank, though its standing as a good subgenus cannot be questioned.

Bombus handlirschi Friese.—Friese's original description of the worker of this species, translated freely from the Latin, is as follows:

"☿.—Black, for the most part fulvous—or ferruginous—hairy; head short; head and thorax above cinereous—sides ferruginous—hairy; segment 1, ferruginous; 2 and 3, fuscous—or fuliginous—4-6, ferruginous—hairy; wings fuliginous. Length, 13-15 mm."

To aid students of the group in determining this species, I append to this description the following:

Ocelli near the supra-orbital line, above the narrowest part of the front. Clypeus smooth and shining, rather delicately punctate. Malar space distinctly longer than it is wide at the apex, a little more than one-fourth the length of the eye. Third antennal segment somewhat longer than fifth; fifth distinctly longer than fourth. Hypopygium without median carina. Head with face, occiput and sides behind the eyes, as well as the entire dorsum of the thorax, including the metanotum, bearing dark ashen gray pile. Pleura from about the level of the tegulæ to the bases of the legs covered with rather light rusty brown pile. Abdomen above with segments one, four, five and six, covered with pile of about the same color as that covering the pleura; segments two and three, except the very side margins, covered with dark fuliginous pile. Abdomen below rather scantily clothed with light rusty brown pile, as are also the side margins of the second and third dorsal segment. Pile on the leg (except on the anterior tibiæ in front and on their inner sides, where it is fuliginous), including the corbicular fringes, all of the same color as that on the pleura and on the venter of the abdomen. Wings strongly infuscate.

Described from three specimens (workers) from Peru, received from Staudinger; in the collection of the Massachusetts Agricultural College.

Bombus parvulus Fabr. It is doubtful if this species belongs to the *Bombinae.* Is the type in existence?

List of Butterflies of North Carolina.

By C. S. Brimley and Franklin Sherman, Jr.,
Raleigh, N. C.

The records presented in this paper are gathered mainly from the experience of the authors. Mr. Brimley has for many years kept a record of the more common species occurring at Raleigh, and of recent years his list has been extended and kept with even greater care and detail. The notes on seasonal distribution are based mainly on his records, amended to conform to the records obtained in other localities. Mr. Sherman has collected many specimens from widely separated localities throughout the State, and it is mainly from his records that the geographical distribution is given.

Notes on the occurrence of eighty species at Tryon, at the edge of the mountains near the South Carolina line, have been kindly furnished by Mr. W. F. Fiske, Special Agent, Bureau of Entomology, U. S. Department of Agriculture. A list of species known at Cranberry, in the mountains near the Tennessee border (where high mountains furnish a touch of boreal fauna), was published by Dr. Henry Skinner, in Ent. News, March, 1893. Another list for the same locality, by Mr. Lancaster Thomas, appeared in the News for May, 1899. A number of scattered records from various localities are from captures by representatives of the North Carolina Department of Agriculture and from reliable published records.

Our survey of the butterfly fauna of the State is by no means complete. While we believe that we have collected nearly all of the species (one hundred and eleven being here recorded), there are no doubt several, especially among the Hesperidae, which we lack, and extensive collections have been made in so few localities that much is yet to be added to our knowledge of exact distribution. But, as we have both ceased to actively collect these insects, we feel that it is best to publish the list while the records are fresh.

We have here followed the classification of Smith's Check-list of Lepidoptera (1903), and, although we prefer the sepation of the Pierids as a separate family, we believe the sequence and names here used will at least be more convenient than that given in any other recognized list.

The letters in parentheses after the localities—(C.), (E.), (E.-C.), etc.—refer to the locality in the State, as central, eastern, east-central, etc.

NYMPHALIDAE.

1. *Danais plexippus* Linn. Generally distributed. Late March to end of November.
2. *Agraulis vanillae* Linn. In mountains of western section, especially southward, and at Raleigh (E.-C.) in 1905. Not noted previously.
3. *Euptoieta claudia* Cram. Generally distributed. Middle of July to end of November, sparingly from April to July. Larvae sometimes destructive to violets and pansies.
4. *Argynnis diana* Cram. Principally confined to mountains, but two have been noted at Raleigh (E.-C.). Mid June to September.
5. *Argynnis cybele* Fabr. Common in mountains, sparingly in middle section, and rare at Raleigh. End of May to middle of September.
6. *Argynnis aphrodite* Fabr. Abundant in mountains but not noted elsewhere. June to September.
7. *Argynnis myrina* Cram. "Mountains of North Carolina."—Holland Butterfly Book, pp. 129-130.
8. *Argynnis bellona* Fabr. One taken and two others seen in drive along mountain roads of Watauga Co., near Tennessee line, in late August, 1906.
9. *Melitaea phaeton* Drury. Two localities, both in mountain section; Tryon (SW.) in May and Cranberry (W.) between June and October.
10. *Phyciodes nycteis* Db. and Hew. Three localities, all in mountains—Tryon (SW.), Cranberry (W.), and Blowing Rock (W.). May and June.
11. *Phyciodes tharos* Drury. Generally distributed. From late March to end of November.
12. *Grapta interrogationis* Fabr. Generally distributed. Hibernates. Recorded on wing at Raleigh, every month except December, as late as November 30 and early as January 22.
13. *Grapta comma* Harr. Common in mountains, uncommon at Raleigh, though abundant in fall of 1904. Seasonal range same as preceding, though not so fully recorded.
14. *Grapta faunus* Edw. Two localities, both in mountains. Cranberry (W.) and Blowing Rock (W.) (elevation, 4000 ft.). Common July to September. A strictly mountain species.

15. *Grapta progne* Cram. Cranberry (W.). ENT. NEWS. May, 1899.
16. *Vanessa antiopa* Linn. Occurs at Raleigh in February, March, and April, and in September and October. Also taken in several western localities in mountains at same seasons, and also in August.
17. *Pyrameis atalanta* Linn. Generally distributed. Early April to end of November.
18. *Pyrameis huntera* Fabr. Generally distributed. Common from end of March to end of November.
19. *Pyrameis cardui* Linn. Generally distributed. Not observed all years. At Raleigh common, '03 and '05; not observed other years. One at Faison (E.), October, 1900; Cranberry (W.), 1899; at Tryon (SW.) and Brevard (SW.) in 1904; common at latter place.
20. *Junonia coenia* Hbn. Generally distributed. End of March to end of November; common; abundant latter part of season.
21. *Limenitis ursula* Fabr. Recorded in middle and western sections; At Raleigh early May to middle of October.
22. *Limenitis archippus* Cram. Generally distributed. At Raleigh in early May and from early July to middle of October.
23. *Apatura celtis* Bd. and Lec. Recorded from only two points,—Smithfield (E-C.), July, 1903, and Bushnell (W.), September, 1904.
24. *Apatura clyton* Bd and Lec. One at Raleigh, 1896.
25. *Debis portlandia* Fabr. Generally distributed. End of May to end of October.
26. *Neonympha canthus* Bd. and Lec. Cranberry (W.) (ENT. NEWS, March, 1893).
27. *Neonympha gemma* Hbn. Raleigh (E.-C.) and Tryon (SW.). End of March to end of October.
28 *Neonympha phocion* Fabr. Recorded from eastern and middle sections of State End of May to end of September.
29. *Neonympha eurytris* Fabr. Generally distributed. At Raleigh from early May to early July, but taken September 1st at Bushnell (W.) in the mountains.
30. *Neonympha sosybius* Fabr Recorded from edge of mountains eastward. Early April to early October.
31. *Satyrus pegala* Fabr. To this species we refer a number of our eastern specimens on account of their large size and the absence or rudimentary condition of the eye-spot in the males. At Raleigh from July 1st to October 1st.
32. *Satyrus alope* Fabr. To this species we refer a smaller form taken in the mountains in July and August.

LIBYTHEIDAE.

33. *Libythea carinenta*, var. *bachmani* Kirtl. Rare at Raleigh in April and May. One at Highlands (W.) in mountains in September, 1906.

ERYCINIDAE.

34. *Calephelis caenius* Linn. Fayetteville (E.), July, 1903.

LYCAENIDAE.

35. *Thecla halesus* Cram. Tryon (SW.), May; Lumberton (SE.), September; Wallace (SE.), March.
36. *Thecla m-album* Bd. and Lec. Three localities, all in mountains, April and August.
37. *Thecla melinus* Hbn. Generally distributed. End of March to end of October.
38. *Thecla edwardsi* Saund. Tryon (SW.), July.
39. *Thecla calanus* Hbn. Tryon and Cranberry; June, July.
40. *Thecla damon* Cram. Several localities, from edge of mountains eastward. End of March to middle of August. Never common.
41. *Thecla cecrops* Fabr. Generally distributed; common at times, but seemingly rare at Raleigh. Early April to early September.
42. *Thecla augustus* Kirby. Tryon (SW.). Middle of March to late May.
43. *Thecla irus* Godt. Raleigh and Tryon. April and May.
44. *Thecla niphon* Hbn. Three localities, from edge of mountains eastward. Middle of March to end of June.
45 *Thecla titus* Fabr. Raleigh and Tryon; one record each. June and July.
46. *Feniseca tarquinius* Fabr. Four localities, from mountains to east middle section. May, June, and October.
47. *Chrysophanus hypophlaeas* Bdv. Many localities, from east-central section westward. Late March to late November.
48. *Lycaena pseudargiolus* Bd. and Lec. Generally distributed. Middle of March to early October.
49. *Lycaena comyntas* Godt. Generally distributed. Late March to middle of November.

PAPILIONIDAE.

50. *Pieris protodice* Bd. and Lec. Generally distributed. Middle of March to end of November. Not common at Raleigh.
51. *Pieris rapae* Linn. Generally distributed. Early March to end of November. A pest.
52. *Anthocharis genutia* Fabr. Raleigh and another central locality. End of March to late April.
53. *Catopsilia eubule* Linn. Generally distributed. Early April to middle of November, but with a season in summer when none are taken; much more common in late fall.
54. *Colias caesonia* Stoll. Generally distributed. Has been common at Southern Pines (E.-C.); rare at Raleigh and in the mountains (W.). March, April, July, August, October, and November.
55. *Colias eurytheme* Bdv. From Raleigh (E.-C.) westward. End of March to end of October.

56. *Colias philodice* Godt. Generally distributed; abundant in mountains. March to November.
57. *Terias nicippe* Cram. Generally distributed. Early March to late October.
58. *Terias lisa* Bdv. Generally distributed; less common in high mountains. Middle of June to end of November. One at Raleigh in early April.
59. *Terias delia* Cram. Three localities, from Raleigh (E.-C.) westward. At Raleigh, middle of September to middle of October. At Tryon, April 3d and July 1st. At Raleigh this species is not noted every year.
60. *Terias jucunda* Bd. and Lec. Generally distributed. At Raleigh, middle of August to early October. Like *delia* it is absent some years. At Tryon, observed in late March and early April.
61. *Papilio ajax* Linn. General from edge of mountains eastward. Late March to late August.
62. *Papilio philenor* Linn. General from Raleigh westward; much more abundant in the mountains. Early April to late September. Larva a pest on Dutchman's pipe in ornamental nursery in mountains.
63. *Papilio polyxenes* Fabr. Generally distributed. Late March to end of October.
64. *Papilio troilus* Linn. Generally distributed. Late March to middle of September.
65. *Papilio palamedes* Dru. Common in southeastern section. April to July. Not observed at Raleigh.
66. *Papilio glaucus* Linn. Generally distributed. Late March to middle of September.
67. *Papilio thoas* Linn. In extreme southwest in mountains and along coast. Not taken at Raleigh. June and August.

HESPERIDAE.

In this family the collections are so scattered that the distribution is not well shown; hence, we usually indicate the few localities in which each species has been taken.

68. *Ancyloxypha numitor* Fabr. Generally distributed. Middle of May to end of September.
69. *Pamphila zabulon* Bd. and Lec. Generally distributed. Late April to middle of September.
70. *Pamphila hobomok* Harr. Blowing Rock (W. mountains), August, 1901.
71. *Pamphila metea* Scud. Raleigh (E.-C.) and Tryon (SW.), April and March.
72. *Pamphila attalus* Edw. "N.C." (Skinner, Cat. of N. A. Rhop.); also Edwards (Trans. Am. Ent. Soc., vol. xi, p. 310, as *seminole*.

73. *Pamphila campestris* Bd. Generally distributed. May to middle of November.

74. *Pamphila phylaeus* Drury. Generally distributed. Early August to end of November.

75. *Pamphila brettus* Bd. and Lec. Raleigh and Beaufort (on coast). Early August to early October.

76. *Pamphila otho* Sm. and Abb. Generally distributed. Early August to early September.

77. *Pamphila peckius* Kirby. Several western (mountain) localities. May and August.

78. *Pamphila manataaqua* Scud. Raleigh (E.-C.), Tryon (SW.), Cranberry (W.). Middle of May to middle of August.

79. *Pamphila cernes* Bd. and Lec. Raleigh, Tryon, Blowing Rock. Middle of May to middle of August.

80. *Pamphila verna* Edw. Raleigh, Cranberry. July and August.

81. *Pamphila metacomet* Harr. Raleigh. August. Rare.

82. *Pamphila accius* Sm. and Abb. Generally distributed. Late June to end of November.

83. *Pamphila loammi* Whit. Same references as for *P. attalus*.

84. *Pamphila panoquin* Scud. Beaufort (on coast), June, 1903. Abundant.

85. *Pamphila ocola* Edw. Raleigh and Beaufort. Middle of June to late October.

86. *Pamphila yehl* Skinner. Washington (on coast), July, 1903.

87. *Pamphila vitellius* Fabr. Raleigh, Tryon. June, July, and August.

88. *Pamphila fusca* G. and R. Raleigh, Tryon, Cranberry. May, June, and July.

89. *Pamphila hianna* Scud. Raleigh and Tryon. May.

90. *Pamphila carolina* Skinner. This species, described from this State, has never yet to our knowledge been recorded from any point outside the State. Described from Hamlet (E.-C.). Raleigh, late March; Lumberton, April. One at Raleigh, August 24, 1903.

91. *Amblyscirtes vialis* Edw. Generally distributed. Middle of April to middle of September.

92. *Amblyscirtes samoset* Scud. Tryon, May 28, 1904. Only record.

93. *Amblyscirtes textor* Edw. From mountains eastward. April, July, August, and September.

94. *Pyrgus tessellata* Scud. Generally distributed. April to end of November.

95. *Pyrgus centaureae* Ramb. Tryon (SW.), Montvale (SW.). April.

96. *Nisoniades brizo* Bd. and Lec. Raleigh. Late March and April.

97. *Nisoniades icelus* Lint. Tryon. April.

98. *Nisoniades lucilius* Lint. Raleigh. May.

99. *Nisoniades persius* Scud. Tryon. May.

100. *Nisoniades martialis* Scud. Raleigh (E.-C.), Southern Pines (SE.), Tryon (SW.). April, July, and August.

101. *Nisoniades juvenalis* Fabr. Raleigh, Tryon, Cranberry. March, April, and August.
102. *Nisoniades petronius* Lint. Cranberry, between June and October.
103. *Nisoniades naevius* Lint. Raleigh. May 26, 1906.
104. *Pholisora catullus* Fabr. Generally distributed. Early March to early September.
105. *Pholisora hayhursti* Edw. Beaufort (on coast). June 24, 1903. Common.
106. *Eudamus pylades* Scud. Generally distributed. Middle of April to early August.
107. *Eudamus bathyllus* Sm. and Abb. Generally distributed. Late March to early September.
108. *Eudamus lycidas* Sm. and Abb. Raleigh, Tryon, Cranberry. May, June, and August.
109. *Eudamus cellus* Bd. and Lec. Tryon. May, June, and July.
110. *Eudamus tityrus* Fabr. Generally distributed. Late March to early October.
111. *Eudamus proteus* Linn. Wilmington (extreme SE.), Raleigh, Tryon. July, September, and October. Seemingly rare.

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A New Ant Lion-fly from Arizona.

By Nathan Banks.

During the past few years the described species of American Myrmeleonidæ have nearly doubled. The greater part of the increase, however, has been in one genus—*Brachynemurus*. The species I now add belongs to the genus *Glenurus*, of which there was previously but one species,—*G. grata*,—a large and handsome form from Florida, and some points on the Gulf Coast.

I dedicate this new species to its collector, Dr. Snow, whose energy and perseverance have made the collection of insects of the University of Kansas one of the great collections of the country.

Glenurus snowii n. sp.

Face black in middle, yellow on sides and under the eyes, black above antennæ, vertex pale with black marks, a transverse line from eye to eye, a median stripe widened in front and divided behind, and a black spot in the yellow each side near eye; antennæ yellowish-brown, basal joint partly black; palpi black, basal joints mostly yellowish; pronotum dull black, with a narrow median yellow stripe and a short indistinct yellowish streak in each side; rest of thorax black, with a median yellow line throughout posterior margin of mesoscutellum, a transverse line connecting lateral lobes and an elongate spot each side near middle, yellow; apex of metascutellum and a spot on each side lobe are yellow; abdomen black, a minute yellow spot on middle at base of segments 4 and 5; 6, 7, and 8 faintly yellow on the posterior margin. Wings hyaline; hindwings with a large black apical mark, much like that of *G. gratus*, but its inner margin is irregular and prolonged on middle, and leaves three pale spots, the apical one containing a minute dark dot. Between the subcosta and radius is a series of black spots nearly reaching to base of wing, and the longitudinal veins are marked interruptedly with black. The forewings are marked all over with black spots; the posterior apical margin is faintly black, and there are two large irregular subapical spots connected together, and a large spot on the middle of the posterior margin. There is a series of spots, more or less connected, between the subcosta and radius, also between median and cubital veins, several on the posterior margin and many small ones elsewhere on the wings, especially beyond the large subapical spots. Nearly all of the veins are marked with black, the cross-veins mostly in the middle.

There are 7 cross-veins before origin of the radial sector in the forewings, only 1 in the hindwings; about 12 branches to the radial sector in the forewings.

Expanse 74 mm.

One specimen from the Baboquivari Mountains, Arizona (Snow). Professor Snow informs me that he has another specimen.

Discovery of Blood-sucking Psychodidae in America.

BY D. W. COQUILLETT.

Among the members of the family Psychodidæ the genus *Flebotomus* (or *Phlebotomus*, as it has been unwarrantedly amended) is the only one known to partake of the blood of man and other animals after the manner of mosquitoes. Up to the present time this genus has been recorded only from the southern part of Europe. Its occurrence on the western continent is now herewith recorded for the first time. In the summer of 1905 Mr. H. S. Barber captured two specimens of an undescribed species on Plummer's Island, Maryland, and in the following year Messrs. Barber and E. A. Schwarz collected specimens of a second species in Guatemala, in both of which localities the blood-sucking propensities of the females were fully demonstrated. Both of these species differ from the published figures of the European *F. papatassii* (Loew, Ent. Zeit. Stettin, v, tab. 1, fig. 5, and Van der Wulp, Dipt. Neer., pl. ix, fig. 10) in that the first vein of the wings, instead of terminating opposite the proximal end of the first submarginal cell, is prolonged to a point opposite about one-fifth of the length of this cell. The male of only one of our species is at present known, and in this the horny terminal portion of the claspers is different from, though on the same plan, as in the two European species as figured by Rondani (Ann. Soc. Ent., France, 1843, pl. x, figs. 2 and 5).

Flebotomus vexator n. sp.

Yellow, the mesonotum brown, hairs chiefly brown; legs in certain lights appear brown, but are covered with a white tomentum; wings hyaline, unmarked; the first vein terminates opposite one-fifth of the length of the first submarginal cell; this cell is slightly over twice as long as its petiole; terminal, horny portion of male claspers slender bearing many long hairs; the apex terminated by two curved spines which are more than one-half as long as the preceding part, and just in front of these are two similar spines, while near the middle of the length of this portion is a fifth spine similar to the others. Length 1.5 mm.

Plummer's Island, Maryland. One male and four females, collected June 23 and July 13, 1905, and July 13, 17, and 29, 1906, by Messrs. H. S. Barber and E. A. Schwarz. Type No. 10,154, U. S. Nat. Mus.

Flebotomus cruciatus n. sp.

Same as *vexator*, except that the hairs are chiefly yellow and the first submarginal cell is about three times as long as its petiole. Male unknown.

Cacao, Trece Aguas, Alta Vera Paz, Guatemala. Five females, collected April 2, 15, 18, and 26, 1906, by Messrs. H. S. Barber and E. A. Schwarz. Type No. 10,155, U. S. Nat. Mus.

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AS SEEN IN THE PARK. A Boston gentleman and his small grandson were in an electric car one day when a young man with a black band on his sleeve got in. The little boy looked at it and then said, "Grandpa, why does he have that on his sleeve?"

His grandfather replied, "Because he has lost some relative. It is called a 'sorry rag.'"

"Oh," said the boy, "I thought it was to keep the caterpillars from crawling up!"—*Magazine.*

Check-List of North American Diptera Pupipara.

By Dr. P. Speiser, Zoppot, Germany.

Note.—Dr. Speiser sent me the following to be inserted in a supplement to my Catalogue. Not contemplating a supplement in this form, I publish it by itself, as it contains the latest views of the chief authority in this group, with some important synonymy. References are given where not found in my Catalogue.—J. M. Aldrich.

HIPPOBOSCIDAE.

Hippobosca L.
    equina L.
Melophagus Latr.
    ovinus L.
Lipoptena Nitsch.
    depressa Say (*mazamae* Rond.). Syn. by Speiser, Ann. Mus. Genova, 1904, 334.
    var. *mexicana* Towns.
Ornithoica. Rond.
    confluenta Say (*vicina* Walk.).
Ornithomyia Latr.
    avicularia L.
    butalis Coq. (This is, I believe, but a synonym of the foregoing species.)
    anchineuria Speiser, Zeitsch. f. Hym. u. Dipt., 1905, 348 (*pallida* Say, preoccupied).
    varipes Walk.
    pilosula Wulp. Note.—Austen has mistaken my genus *Ornitheza*, which is palaearcto-indoaustralian.
Ornithoctona Speiser.
    fusciventris Wied.
    erythrocephala Leach.
    bellardiana Rond.
    haitensis Bigot.
    ?*nebulosa* Say.
Ornithopertha Speiser.
    nitens Bigot.
    geniculata Bigot, Humming Bird, ii, 49. Central America, Speiser, Ann. Mus. Hungar., 1904, ii, 393.
    anthracina Speiser, Ann. Mus. Hungar., 1904, ii, 393.—Honduras.
Stilbometopa Coq.
    fulvifrons Walk.
    impressa Bigot.

Olfersia Leach.
    americana Leach.
    pallidilabris Rond.
    intertropica Walk.
    propinqua Walk.
    ardeae Macq.
    albipennis Say.
    angustifrons Wulp.
    ? *villadae* Dugés.
    ? *fuscipennis* Macq.
    ? *obliquinervis* Rond. Note.—The last three may belong to *Pseudolfersia*.
Pseudolfersia Coq.
    fumipennis Sahlberg, Medd. Soc. Fauna Fenn., v, 13, 1886, p. 150.
        (*maculata* Coq. Syn unpublished).
    sordida Bigot.
    coriacea Wulp.
    vulturis Wulp.
    spinifera Leach.
    var. *sulcifrons* Thoms.
    mexicana Macq.
Lynchia (Wyenb.) Speiser.
    pusilla Speiser
    ? *brunnea* Oliv. Cf. Speiser, Ann. Mus. Hungar., ii, 388.
Brachyplomyia Williston.
    fimbriata Waterhouse, Proc. Zool. Soc., Lond., 1887, 164.
        (*femorata* Williston.)

STREBLIDAE.

Subfamily NYCTERIBOSCINAE.

Trichobius (Gervais) Towns.
    parasiticus Gervais, Atlas de Zoologie, 1844, p. 14.
        (*dugesii* Towns.)
    major Coq.
Aspidoptera Coq. (*Lepopteryx* Speiser, Arch. Naturgesch., 1900, 53.)
    phyllostomatis Perty, Delectus animalium, etc., 1830, 190, pl. xxxvii, fig. 16 (*Lipoptena*).
        (*buscki* Coq.). Syn. by Speiser, Arch. Naturgesch., 1900, 53.
Pterellipsis Coq.
    aranea Coq. (*Megistopoda desiderata* Speiser, Arch. Naturgesch., 1900, 57, pl. iii, f. 6.) Syn. in Zoolog. Anzeig., xxiii, 154, 1900, with preceding.
Megistopoda Macq.
    pilatei Macq.

Subfamily STREBLINAE.

Strebla Wied.
  wiedemanni Kolenati, Die Parasiten der Chiropteren, 1856, 46.
    (*vespertilionis* Fabricius, 1895, nec. Nitsch, 1803.)
    (*mexicana* Rond.)
  avium Macq.

NYCTERIBIIDAE.

Penicillidia Kolenati.
  mexicana Bigot.
Nycteribia Latr.
  antrozoi Towns.

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ADDITIONAL NAMES of persons willing to identify certain insects (see February NEWS, page 59):*

Mr. C. T. Brues, Public Museum, Milwaukee, Wis., Parasitic Hymenoptera and Phoridæ.

Mr. August Busck, U. S. National Museum, Washington, D. C., Micro-Lepidoptera.

Mr. Nathan Banks, East Falls Church, Va., Neuropteroid Insects,—all groups except Odonata.

Prof. W. M. Wheeler, American Museum of Natural History, New York, Formicidæ.

Mr. Frank Haimbach, 150 Sumac Street, Philadelphia, Pyralidæ.

Dr. E. Bergroth, 7 West Superior Street, Duluth, Minn., Exotic Hemiptera-Heteroptera, North American Tipulidae.

Prof. C. F. Adams, Fayetteville, Ark., Diptera, especially Oscinidae.

John A. Grossbeck, 337 Suydam Street, New Brunswick, New Jersey, Geometridae.

Dr. H. T. Fernald, Amherst, Mass., Sphecidae of all America.

Mr. E. A. Back, Amherst, Mass., Asilidae.

Mr. H. J. Franklin, Amherst, Mass., Bombinae.

Mr. H. M. Russell, Amherst, Mass., Ophionini.

Mr. A. H. Armstrong, Amherst, Mass., Ceropalidae.

Dr. A. Fenyes, Pasadena, Cal., Aleocharinae of the world.

J. R. de la Torre Bueno, 25 Broad St., New York, Aquatic Hemiptera (except Corixidae).

THE expedition of the California Academy of Sciences to the Galapagos Islands has returned. Many of the coast islands were also visited. An immense series of specimens, both botanical and zoological, were secured. The two entomologists of the party were Mr. F. X. Williams, of Leland Stanford, Jr., University, and Mr. J. S. Hunter, formerly of the University of California. Mr. Hunter, however, devoted most of his attention to birds and mammals.

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* It will be best to write to these gentlemen before sending insects.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MARCH, 1907.

THERE are certain sources of error in describing new species about which we are requested to speak. These errors are brought about by two conditions that are not unusual. It should not be forgotten that species that run out in a poor table are not necessarily new. In groups that are little known and complex, and where there are many species and where the group has not been monographed, it takes a good working knowledge of all the species described before it is safe to declare that any species is really new to science. Of course it is a good thing to have tables, but it is bad to rely on them to the exclusion of a more accurate knowledge. Synonymy is an evil unless the synonym has been well described or accurately figured. It is certainly an evil to be too much in haste in describing new forms, or to describe species (so called) that are so close to known species that the differences cannot be adequately made out by word descriptions.

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PROGRESS OF THE "BIOLOGIA CENTRALI AMERICANA."—With the publication of Part CXCIII, in October, 1906, this work has made the following advances as compared with our account given in the NEWS for December, 1905: Coleoptera, vol. IV, part 4 (Rhynchophora, part , by G. C. Champion has been completed, and, with parts 3, 5, and 6, by D. Sharp, G. C. Champion, W. F. H. Blandford, and K. Jordan, in course of publication, this group of beetles is now represented by 1376 pages and 59 plates. The Odonata, by P. P. Calvert, have reached page 368 and plate viii. Vol. II of the Orthoptera, by L. Bruner and A. P. Morse, has attained page 208 and plate ii.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

BRIEF NOTES ON THE HABITS OF *Podagrion mantis* ASHMEAD.—During April and May, 1906, these parasites began to emerge in numbers from a lot of egg-masses of *Stagmomantis carolina* Linnaeus, collected in the late winter of the same year from various fruit trees. The period of emergence covered a month or more, and the parasites appeared to be in various stages of post-embryonic development at the time they were collected. After all of them had emerged, all traces of them were lost until the following November, when the egg-masses of the mantids were again available as hosts. How the period intervening between their emergence in the spring and the deposition of their known host eggs the following fall is passed remains obscure. In November many of the recently deposited egg-masses of *carolina* were examined, with the result that the parasites were again present within them in both adult and larval stages, the former apparently about to emerge. Each larva occupied and completely filled, when full grown, an individual egg in the pod. On November 26, 1906, a female was found ovipositing. Thus this fall generation is mixed, but the majority of the brood seem to pass the winter to emerge as adults in the spring of the next year.

From 10 egg-masses of the mantid there were reared 578 *carolina*, 240 *Podagrion*, and 12 hyperparasites, making a total of 830 individuals reared, with an average of about 83 to the egg-pod. Including the 12 hyperparasites, making a total fatality in *carolina* of 252, the percentage of parasitism by *Podagrion* is 30.4 per cent., which seems to be a fair average.

The method of oviposition in *Podagrion* is not unusual, but interesting because of the slenderness and length of the ovipositor. The process takes some minutes, but I was unable to obtain actual records. When the ovipositor has been pressed into the host for its entire length the tips of the valves remain applied to the point of insertion, while they themselves bend caudad more and more as the ovipositor is thus pressed into the egg-pod for all of its great length, until at last they extend far beyond the body in the shape of a long-armed letter U. This gives the insect a very peculiar and almost grotesque appearance.

This insect also feigns death like the curculios. When roughly disturbed I have seen them roll over on their side, fold the legs and antennæ against the body, and in this position remain motionless and stiff for two to five seconds, and then quickly regain their feet.—A. ARSENE GIRAULT, Myrtle, Ga.

RARE BUTTERFLIES.—The question "Which is the rarest butterfly in North America?" to which three pages were devoted in the January ENTOMOLOGICAL NEWS, is not one that would be asked by a scientist, but is such a one as I have sometimes been asked by people who neither knew nor cared anything about entomology, but thought it necessary to try to converse with me upon a subject in which they knew I was interested. Such a question would be foolish unless with the implied qualification "so far as known," and would probably be intended to apply to butterflies in nature rather than in collections, though most people would very naturally suppose that the two conditions would go together.

It could also only properly apply to a species, and not merely to an aberration; nor would it be reasonable to apply it to a species of which only one specimen might have been taken north of the Mexican boundary though abundant south of it.

Limited in that way, I would submit that there is no answer, as there is no one species which could be so designated, as there are several apparently valid species which are known only from a single type.

If, however, one were asked to make choice among these one might, perhaps not unjustly, award the palm of rarity to a species known from a single type, taken many years ago in a well-worked district, in which case it would probably go either to *Eudamus electra* Lint, known only from the type in the Edwards' collection, and which was caught at Hamilton, Ont., in 1877, by the late Mr. J. Alston Moffat, or to *Ancyloxypha longleyi*, as referred to by Dr. Skinner. I have seen the former specimen and it is certainly most interesting, but Dr. Holland, in whose possession it now is, suggested that it might be an exotic species which had been brought to Hamilton in the pupal stage with some plant. That certainly should be investigated by comparison with the British Museum collection.

As to which obtainable butterfly is confined, so far as known, to the smallest geographical area and produces the least number of individuals, I would hardly like to hazard an opinion unless reference is intended to *Argynnis alcestis*.—H. H. LYMAN.

HIBERNATION OF COLEOPTERA.—On December 22d a workman brought me two fine live specimens of *Cotalpa lanigera* L., and on January 2d another specimen of same species, and also one of *Bolboceras farctus* Fabr., and one of *Lachnosterna* sp. They were found buried four feet deep in sandy soil, which was being excavated in search of moulding sand. The interest in the "find" consists in the fact that the fresh, perfect condition of the specimens indicated that they had completed their metamorphosis and assumed the imago form late this fall, and were evidently hibernating through the winter before emerging from the ground. The elytra of the *C. lanigera* were firm and hard, but a delicate creamy color, not darkened by exposure nor marred by any scratches, and consequently the insects could not have burrowed at all since entering the imago stage of their existence. The fact seems worthy of record.—WILLIAM A. NASON, Algonquin, Ill.

CICADA SEPTENDECIM.—I thought perhaps it would be of some interest to you to hear the result of our fight against this destroyer of young trees.

We had a block of peaches on the edge of the woods. We made up our minds two weeks ago that something would have to be done or we would lose the greater part of them. As there were 240,000 trees in the field we felt that we must make some effort to save all we could. We therefore, two weeks ago, put seven men in that field and have kept them there ever since. I asked the man who had charge of them one day last week how many he thought they would kill in a day. He said he did not know, but it would run up in the thousands. I then asked him to keep an account the next day of how many he killed. He reported at night 1200, and said he was sure that the seven men would average 1000 apiece. On this basis we have calculated that in that field alone by this time we have killed 70,000 locusts, and have had some men in a smaller field, so we feel we are not exaggerating when we say that we have killed 100,000 so far in the last two weeks. There are fewer of them the last day or two, and we hope their season of damage is about over.

We had the men count every twentieth row in the field mentioned above of the damaged trees, and on striking an average on the whole lot from the seven rows counted we make our loss over 12,000 in that field alone. —ABNER HOOPES, West Chester, Pa., June 18, 1902.

THE temporary home of the California Academy of Sciences is at 1812 Gough Street, San Francisco. The second series of informal talks upon the Academy's recent Galapagos expedition was given by Mr. Francis X. Williams, entomologist to the expedition.

MR. J. A. G. REHN has recently completed an important paper on Arizona Orthoptera which has been presented to the Academy of Natural Sciences of Philadelphia for publication. The material was collected by Dr. Henry Skinner, Dr. F. A. Snow, Mr. Charles Schaeffer, and Mr. C. R. Biederman.

EXPLAINED.—A friend from the North had gone to visit the colonel, who lived in the swampy Mississippi River bottoms of Louisiana. There was no mosquito netting over the bed, and in the morning when the negro came with the water and towels the tortured visitor asked:

"Sam, why is it that you have no mosquito netting over the beds? Doesn't the colonel have any in his room?"

"No, suh," replied Sam.

"I don't see how he stands it," exclaimed the visitor.

"Well, suh," drawled Sam, "I reckon it's jes dis way: In de fo' part uv the night, suh, de colonel's mos' gen'rally so 'toxicated dat he don't pay no 'tention to de skeeters, an' in de las' part uv de night, suh, de skeeters is mos' gen'rally so 'toxicated dat dey don't pay no 'tention to de colonel."—*Newspaper.*

TETYRA BIPUNCTATA H. S.—Mr. E. Daecke's note before the American Entomological Society (ENTOMOLOGICAL NEWS, January, 1907, vol. xviii, No. 1, p. 32) on this rare hemipteron is of interest, as he mentions a new locality. It is not, however, the first record of the family, nor of the species. It was recorded as occurring in Lakehurst, N. J., some distance further north, in the Journal of the New York Entomological Society for

March, 1905, vol. xiii, No. 1, p. 30, where it is stated that it is found not infrequently in that locality, and is ordinarily taken by beating the pines. Of the two specimens I secured there in May, 1904, one was found dead and dry in a bare, sandy spot, and the other on its back, living and vigorously kicking, in a dusty footpath. Mr. William T. Davis has several of these bugs in his collection and so has Mr. H. G. Barber, all taken in Lakehurst.—J. R. DE LA TORRE BUENO.

BUG HUNTING.—This branch of sport, although extensively indulged in, is seldom enjoyed by the hunter. The dismal hour of midnight is the recognised time for successful bug-hunting in the temperate latitudes.

Bugs will lure at most anything, but a hired girl or a schoolma'am is universally believed to be the most killing bait. Bugs have been known to turn up their noses in disgust at a big, sunburnt farm-hand, and then climb three flights of stairs and squeeze through the keyhole to taste the schoolma'ma. However, even the ordinary lank layman may get a few strikes by carefully selecting his place and time. A combination never known to fail is the bridal chamber of a cheap hotel on a Winter night. The necessary paraphernalia consists of a candle, matches and a paper of pins. Having arranged your outfit, retire as quitely as possible, so as not to frighten the wary game, close your eyes and await results.

If you are lucky, but a short time will elapse before you detect a nibble. At such a moment exercise rigid caution; a sudden movement might cause the game to flee. Keeping the body perfectly motionless, reach out and light the candle, at the same time seizing a pin firmly between the thumb and first finger of the right hand. Inhale deeply. This keeps your pulse regular and throws the game off its guard. By this time you have accurately located the point of contrast, and with a sudden movement, you bring it to view Immediately the game begins a wild scramble for its native jungle, and here is where the sure eye and the strong arm do their noblest work Having impaled the quarry, insert the pin in the wallpaper at the side of the bed, where the victim expires.

An active, patient man will make quite a catch in a night if his pins hold out. It requires a week's stay, as a rule, to secure enough for a mess, but the effort will be repaid Men who make a large kill usually grade their game according to size on cards made for the purpose, and present them to the landlady as a mark of affection She makes a few well-chosen remarks, the hunter hastily collects his luggage, signals the 'bus, and is off to the other fields of fortune.—BY NORMAN H. CROWELL, in Field and Stream.

◆

Doings of Societies.

At the meeting of the Feldman Collecting Social, held on January 16, 1907, at the residence of H. W. Wenzel, 1523 South Thirteenth Street, there were seven members present.

The death, on December 28, 1906, of our fellow member, Mr. Frank Hoyer, was announced.

The President read his annual address.

The following officers were elected to serve for the year 1907: E. Daecke, President; H. S. Harbeck, Vice-President; Frank Haimbach, Secretary; H. W. Wenzel, Treasurer.

FRANK HAIMBACH.

The monthly meeting of the Newark Entomological Society was held January 12th, 1907, in Turn Hall, 184 William Street, Newark, President Dickerson in the chair and thirteen members present. Mr. Frederick Lemmer, of Irvington, was elected to membership, and the topic of willow insects was then discussed.

Prof. Wormsbacher enumerated twenty-eight species of Lepidoptera which he had bred on willow and poplar, among the more rare forms being *Sphinx luscitiosa, Ecpantheria deflorata, Raphia frater* and *Tolype velleda,* this latter, perhaps, recorded from willow for the first time. Mr. Dickerson gave an account of the insects of economic importance, which occur on the willow, and stated that *Cryptorhynchus lapathi* was not destructive to willow and poplar nursery stock in New Jersey. Mr. Bischoff remarked that one hundred or more larvæ of *C. lapathi* may be found tunneling in a few feet of willow branch, and that they were becoming more abundant of recent years at Irvington. Mr. Grossbeck spoke of five species of Sesiids which bore into willow, and stated that he had found old borings in the canes of that plant at Paterson, which were probably those of *Sesia bolteri.* Both Mr. Brehme and Mr. Angleman said they had bred *Sanninoidea exitiosa* from willow, which appears to be a new plant for this species. *Limenitis ursula* was also reported by three different persons as being found on willow and poplar.

Prof. Wormsbacher reported the following rare species of Lepidoptera which he had taken the past summer: *Haploa triangularis,* Hasbrook Heights; *Acronycta hastulifera,* Palisade Park, larvæ abundant on alder; *Feltia volubilis,* Fort Lee, May 30; *Bellura gortynides,* New Durham, August 19; *Plusia* *ou*, Rutherford, September 3; *Eosphoropteryx thyatiroides*, Carlstadt, August 11; *Phaeocyma lunifera*, Guttenberg, October 4; *Packardia elegans*, Fort Lee, larvæ common on *Arburnum; Schizura eximia*, Hasbrook Heights, August 3.

He also furnished a note relating his experience with several species of Sphingids which had emerged from their pupæ in a crippled condition, and after remaining so for a day were sprinkled with water, which brought about their full development. The experiment was tried repeatedly, and in all, save one or two instances, with perfect results.

JOHN A. GROSSBECK, *Secretary*.

◆

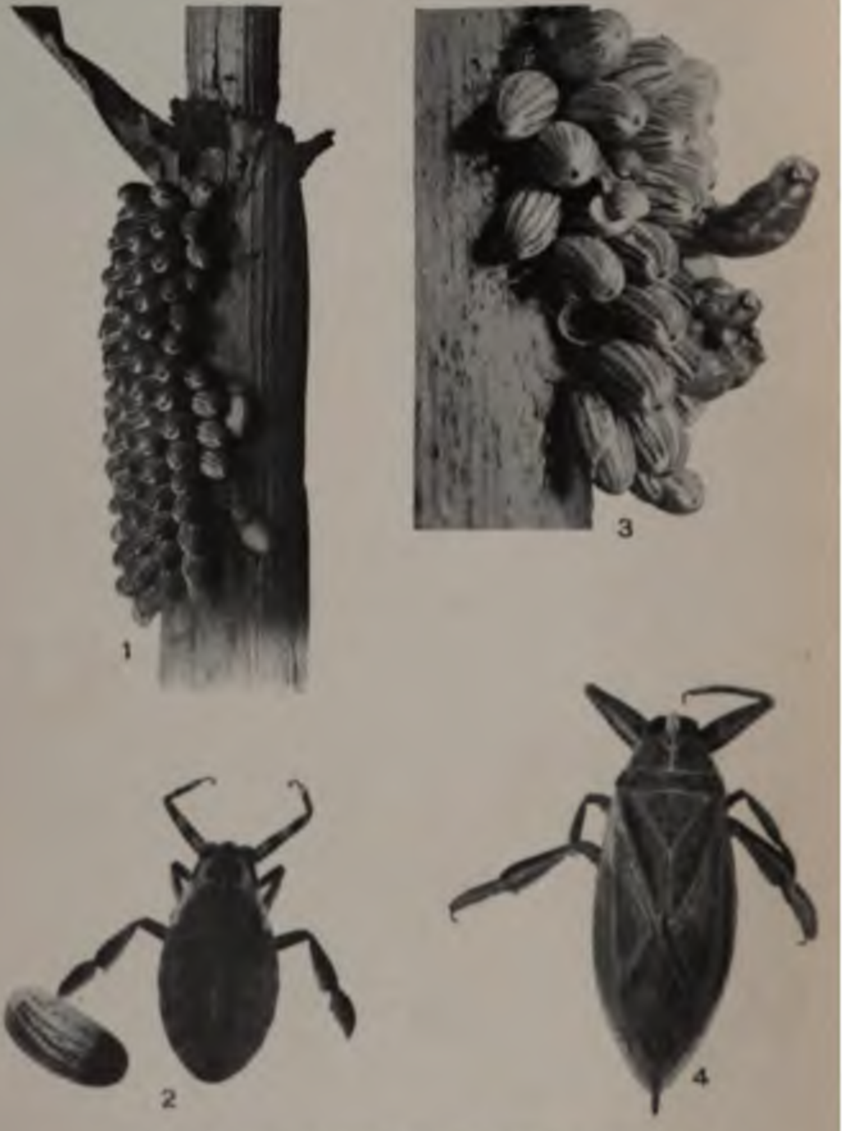
OBITUARY.

It was with great regret that we learned of the death of Frank Hoyer, for a number of years a member of the Feldman Collecting Social of Philadelphia.

WE regret to announce the death of C B Simpson, who has been for nearly three years Entomologist of the Transvaal. He was a graduate of the University of Idaho in 1898; studied nearly three years at Cornell after that; did field work for the Bureau of Entomology in South Idaho two seasons with brilliant results, which induced Dr. Howard to give him his recommendation for South Africa. Over there he was very active and successful, having organized an extensive department in the short period of his service One of his principal subjects in that field was locust extermination He died of typhoid fever on January 14th, at the age of thirty-one years, having been married but ten months. He was developing into a man of commanding ability

DR. RUDOLPH HEISER, of Keokuk, Iowa, died October 27, 1906 He was born in Moehlhausen, Thuringia, on March 10, 1839, and was sixty-seven years old at the time of his death He came to this country in the early fifties with his parents, and has made Keokuk his home ever since. In the year 1866 he was united in marriage with Miss Emilie Roos, who, with one daughter, Miss Emma Heiser, and one sister, Mrs Louis Stracke, of Warsaw, Ill., are left to mourn his death

He was an enthusiastic naturalist taking great interest in the branches of ornithology and entomology, of which he possessed a rare and valued collection He was a skilled taxidermist, and for many years past was curator of the museum of the old Medical College In his early life he enjoyed the sports of field and wood, and was one of the few remaining members of the old Nimrod Shooting Club, incorporated in 1870. He was a subscriber to the News for many years.



EGGS OF BENACUS AND THEIR HATCHING.—NEEDHAM.

ENTOMOLOGICAL NEWS
AND
PROCEEDINGS OF THE ENTOMOLOGICAL SECTION
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The Eggs of Benacus and Their Hatching.

By JAMES G. NEEDHAM.

(Plate II)

Among the largest of insect eggs are those of our aquatic Hemiptera. Some of these are laid under water, some in the air, attached to the stems of plants that project above the surface. Few are better known than those of *Zaitha*, which the male carries through their incubation period in a layer covering his back. Those of *Ranatra* are familiar enough also, though immersed in the stems of aquatic plants: their presence is always betrayed by the two long micropylar appendages that project conspicuously into the water. *Belostoma* and *Benacus* lay their eggs above water, commonly attaching them in broad one-layered clusters to the vertical sides of dead typha stems. Those of *Belostoma* have recently been carefully described by Mr. Bueno. It is strange that those of *Benacus*, the largest of them all, should still remain comparatively unknown and unnoticed.

Benacus occurs sparingly in a pond on the campus of Lake Forest College. A few specimens are taken each year in the course of general collecting. During the past eight years I have done more or less collecting there, from the opening until the middle of June, but I have encountered living eggs but once, that was on June 13, 1903. Doubtless they might have been found oftener had I been specially looking for them; for twice I have found the dead, collapsed, and empty shells still adhering to the typha stems in autumn.

The egg clusters are two to three inches long, and contain 75 to 100 eggs of a size, that for insects, is fairly immense. The eggs are attached by one end in more or less regular rows, and they cover in a single layer the broader, flatter side of the stem. They would be conspicuous but for their resemblance in color to the stem.

Protective coloration is common enough among birds' eggs. Here seems to be another genuine case of it among the eggs of insects—not a mere general resemblance, such as the green color of eggs placed upon a green leaf, but specific resemblance to the details of the background against which the eggs are seen. They are longitudinally streaked with brown upon a lighter ground, and the streakings are so placed and so spaced that they fall into line with the flutings of the stem, and greatly assist in the concealment of the cluster. I left the cluster shown in Plate 2, Fig. 1, in the field for several days undisturbed after its discovery, to insure the normal progress of its incubation, and watched it from day to day. At each return to it I had some difficulty at first locating it again, although it occupied an exposed situation on the stem.

Seen under a lens, the eggs remind one of a pile of Georgia watermelons (Plate 2, Fig. 3). If the color were green instead of brown the resemblance would be perfect. Not only is the shape the same, the "blossom end" being plainly suggested, and the exposed upper side being slightly more convex than the lower, but the streakings fade out below in a very similar manner. However, a closer inspection reveals a different feature at each end. At the free end just below the "blossom scar" there is an obliquely-placed white crescent, whose arms extend down upon the sides and mark out the cap that the young *Benacus* will later push off at hatching. The brown lines of the under surface stop short at the edge of this crescent; they are still more abbreviated at the opposite end of the egg. At the basal end the egg is broadly capped with uniform dark brown (Plate 2, Fig. 2). In Figure 1 of the plate, a few eggs have been removed from the right side, and two are laid down in an inverted position to show the paler lower side and the brown basal end.

The individual egg is 5 mm. long and 2 mm. in greatest diameter. It is oblong-oval in form, with very obtuse ends as shown in the figures, and it is marked longitudinally with twenty or more irregular stripes (often interrupted, cleft fenestrate, or anastomosing, and always with uneven margins), convergent toward the center of the free end upon the upper side.

Their incubation period was not determined. The single cluster of unknown age found upon the 13th of June, began hatching on the 23d and finished on the 24th of the same month. Their hatching was a curious sight. The photograph shown in Fig. 3 of the plate, was taken in the midst of the process and shows two empty eggshells, several eggs in the process of "chipping," and four buglings emerging, the uppermost one nearly out and the lowermost, just lifting the detachable cap of the shell. The embryo lies once folded within the shell, its head flexed upon its breast, and its beak and legs extended flat against the venter of the abdomen. Thus the dorsum of the prothorax abuts against the detachable crescentic groove. The eyes appear before hatching as back spots upon the arms of this crescent. The back is almost invariably downward, as seen in the figure, though sometimes turned a little to one side. On account of the obliquity of the pale crescent, and the constant position of the embryo in relation to it, these eggs might readily be oriented for section-cutting in embryology.

The thin lateral margins of the abdomen unrolling at hatching, and the legs becoming extended, the fledgling at once assumes proportions seemingly wholly incompatible with the size of the egg from which it came. Figure 2 of the plate shows a newly hatched larva and an unhatched egg taken together for comparison.

Figure 4 of the plate is a photograph from life of the adult *Benacus*. It was taken while clinging to a white board in an aquarium, head downward (the photo print accidentally mounted in the opposite position for the plate). As is well known, the adult flies freely from pond to pond, coming with *Belostoma* to electric lights in cities and towns. It lays its eggs upon a dry stem several inches above the surface of the water.

Studies in Certain Cicada Species.

By John B. Smith and John A. Grossbeck.

Plates III, IV, V.

This study originated in the desire of the senior author to prepare for his annual report an account of the periodical *Cicada*, a brood of which was due to appear in New Jersey, in 1906, and incidentally, to call attention to the other species that occurred within the limits of the State. Messrs. Davis and Joutel had just published their notes in Entomological News, Vol. XVII, page *237*, and the junior author was assigned to the task of separating out our material which was fortunately quite rich, and to making such drawings and sketches as might be required to bring out the interesting features:– ovipositor, stridulating apparatus and the like. It was easy to separate the bulk of our material into the species recognized by Davis and Joutel, the more as Mr. Davis had used some of it in his work; but there remained a puzzling residue, part of which was eliminated when Prof. Osborn published his description of *Cicada fulvula* in Entomological News, Vol. XVII, page 322. None of the recent authors had seemed quite satisfied with the identification of *pruinosa* Say, and our own efforts to fit the specimens usually listed under that name to the description were hardly more satisfactory. But we found among our puzzles a very few examples that did fit, perfectly: the description as it stood might have been made from any one of them But this left the common form nameless, unless some of the terms cited as synonyms of *tibicen* might really prove to be this form. The idea of including our study in the annual report was now abandoned and additional material sought for. As usual, the collections proved poor in the common species, but from the Academy of Natural Sciences of Philadelphia, the Brooklyn Institute Museum, the American Museum of Natural History, the Children's Museum of Brooklyn, the U. S. National Museum at Washington, and from Messrs. W. T. Davis and E. Daecke we obtained series that enabled us to separate our species very nicely.

It became necessary now to determine the form to which Linné's term should be applied, and here another surprise was in store for us. The description of course fitted almost any *Cicada;* and the only pointer given by Linné himself was the reference to Merian's Surinam, pl. 49, where we found a fair figure of a species totally different in appearance from what we had been calling *tibicen.* Running down the literature to ascertain *how* the species came to be identified with our American type, we found that it rests upon a casual statement of Stal. The whole matter is interesting enough to warrant detail and both authors have been over some of the volumes to make sure of the facts.

On the occasion of a recent visit to Washington, Mr. O. Heideman was good enough to show me the *Cicada* material from Central and South America, and there is nowhere any specimen that could be mistaken for our so-called *tibicen,* while there are several of a type resembling Madame Merian's figure and among which I feel very confident the true *tibicen* may be identified. Mr. Heideman also showed me the works of Mr. Distant, and called my attention to the fact that in the "Biologia" *tibicen* was included only on the authority of Stal and not from any material identified with that species.

C. tibicen was described by Linné in the Syst. Nat. ed., X, p. 426, in the most general terms; the Merian figure already cited was referred to, and "Habitat in America" was added for locality. In 1767, in the 12th edition of the same work, Vol. I, pt. 2, the description and reference were repeated and nothing was added to modify the original statement as to locality.

In 1775, Fabricius in the Syst. Ent., 679, places the *Cicada* *tibicen* of Linné in *Tettigonia,* cites Merian's Ins. of Surinam as before, and also Brown's Jamaica, pl. 43, f. 15. This figure which has been examined by Mr. Grossbeck may or may not be a species of the forms we have called *tibicen,* but it certainly does not seem to be the species figured by Madame Merian.

In 1778, De Geer, in his Insects, III, *212,* pl. 32 (not *22* as usually cited), figures his *lyricen.* He cites *tibicen* Linn. as the same species, and credits Mme. Merian with the name *lyricen* or "lierman." He adds to his diagnosis the statement that the species is found in America "septentrionale" as well as "meridionale" and gives a detailed description of his material from New Jersey and Pennsylvania both as larva and adult, including the singing and egg-laying habits of the adult. There is no doubt that De Geer had a North American insect before him and there is no reasonable doubt that this was the exact form that Prof. Osborn has so recently described as *C. fulvula.* The figure is excellent and the description is accurate in all details. There can be no reasonable doubt as to the identity of *lyricen* De G.

In 1790, Olivier in the Enc. Meth., 749, refers to *tibicen* Linn., cites *lyricen* De Geer as a synonym, and quotes Merian as to the habits of the species and the damage done in coffee plantations.

As a new species he describes *C. opercularis* from the Isle of Java and cites Stoll, pl. 13, A and B, for a representation of the species. This figure of Stoll is utterly unlike anything that I know from North America, and is certainly incapable of being twisted into a resemblance to our "tibicen" or even the *tibicen* of Linné.

In 1794, Fabricius in the Ent. Syst., IV, 18, again refers to *tibicen,* as before, but adds the reference to De Geer, giving America meridionale as the habitat. On p. 19 he describes *Tettigonia variegata,* habitat in Carolina, just after *septendecim,* and says of it that it is of the size and build of the preceding, i. e., *septendecim.* There is nothing in this, and nothing in the subsequent description that refers to any resemblance or relation to *tibicen.*

In 1803, Fabricius in the Syst. Rhyng., p. 35, cites *tibicen* as before, and again gives America meridionale as the habitat. To this is added, in the Academy copy, in Say's handwriting, "St. Paulo, Brasilia, Germar," indicating that some effort has been made to identify this with a South American form.

At p. 37, *variegata* is again described, placed as before and recorded from Carolina.

In 1825, Say described his *pruinosa,* knowing of the Fabrician and Linnæan species; but what forms he identified with the names I have no means of knowing.

In 1830, Germar gives in Thon's Archiv., II, p. 40 et seq., a descriptive list of Cicadids in which he refers to *variegata* Fabr., describes it at some length, and cites Roesel's Ins., pl. XXV, f. 5, as representative of the species.

Roesel's figure, unfortunately, tells nothing. It is not well drawn for identification and may be meant for any one of half a dozen or more species. It is said to be an "Indian" variety, but this may mean American as used.

Germar also refers to *opercularis* Oliv., gives Java as the habitat, and then adds that he believes it to be a variety of *variegata* in spite of the difference in locality. He cites Stoll's figure as usual and there is at least one important hint in this, because Stoll's figure does resemble *septendecim* in general build, and the Fabrician comparative reference is therefore in so far confirmed.

Walker's work in 1857 adds little to our knowledge, but he makes *lyricen* De G., *pruinosa* Say and *mannifera* Linn. synonyms of *tibicen,* while recording *opercularis* as a species unknown to him.

In 1869, Stal in his Hemiptera Fabriciana, II, 6, cites the *tibicen* of Linné, gives all the Fabrician references, adds as an additional synonym *opercularis* Oliv., gives America meridionalis as habitat and then comments:—this species inhabits boreal America.

Since that time matters have remained much as Stal left them. In 1841, Dr. Harris described *canicularis* in "Insects Injurious to Vegetation," p. 175, but Fitch disposes of that species in his Third Report in 1856. He says *pruinosa* is *tibicen* with the mealy powder not rubbed off, and *canicularis* is only a small *pruinosa*. He quite correctly calls attention to the variation in the opercular plates and says they are not good bases for specific separation.

In 1892, Uhler in the Trans. Md. Acad. Sci., p. 149, makes *canicularis* a good species, but cites under *tibicen*, the names *lyricen*, *variegata*, *opercularis* and *pruinosa* as synonyms. He states that according to Germar the true *tibicen* is the common form figured by Stoll, and that Olivier's species having been described from that figure must be a synonym.

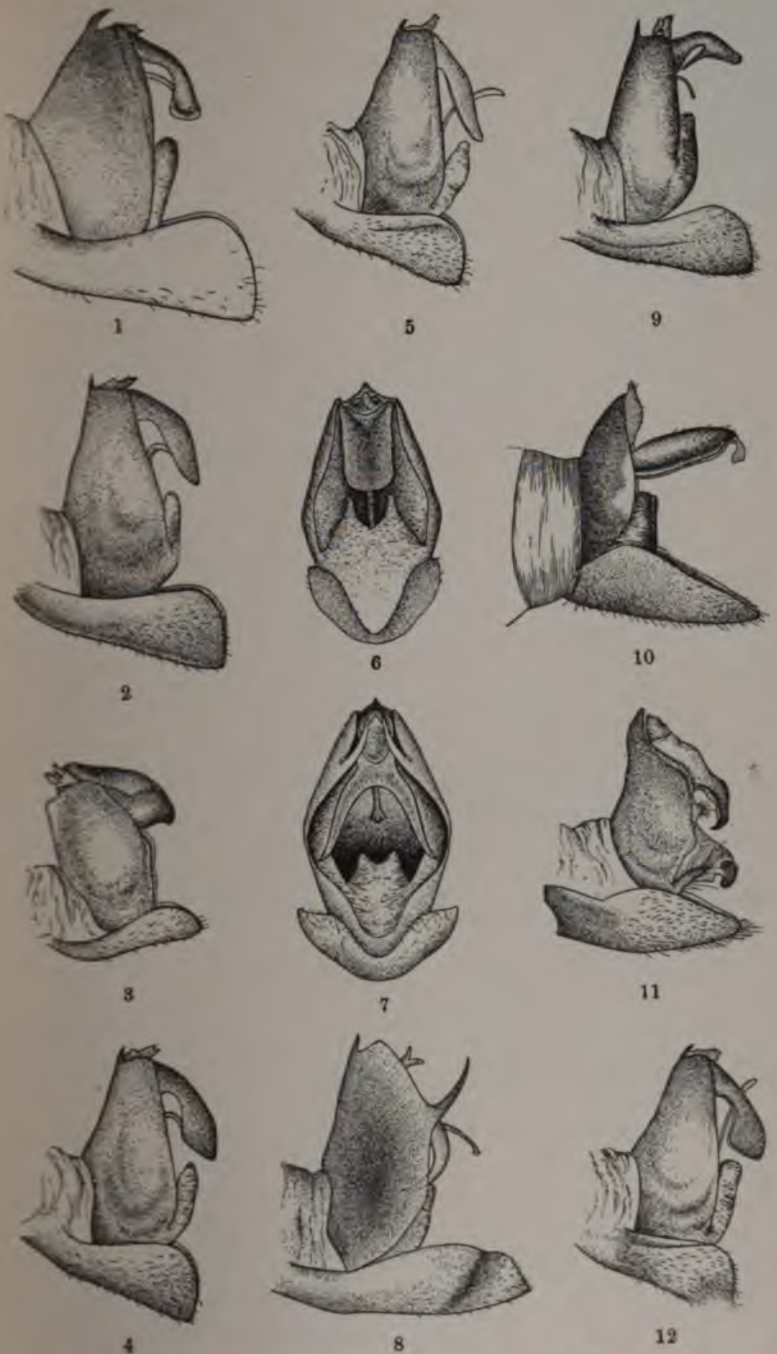
The most recent list of species is by McGillivray in the Can. Ent., XXXIII, p. 74, in which Uhler is followed as to *tibicen*, without original study of the problem.

The conclusions drawn from this study of the literature are that *C. tibicen* L. is not a North American species at all; but that, based on Merian's figure, it is a common Central and South American species. What we have called *tibicen* is an undescribed species. *C. opercularis* Oliv. is a Javan form for which there is absolutely no evidence that warrants us in identifying it with any American species. *C. variegata* Fabr. is an ally of *septendecim* which has not yet been identified in collections. *Lyricen* De G. has been redescribed as *C. fulvula*. De Geer's belief that he had the same form as Linné is based on nothing better than a general similarity.

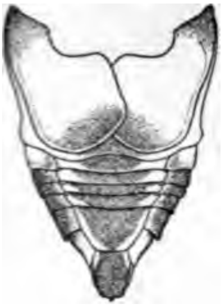
The notes on structure and the specific descriptions are by the junior author, though all points have been verified by both authors.

It seems strange that such large and common insects should have received so little careful attention. In most of the collections seen by us there were from two to five, and in one instance nine, species under the name *tibicen*. It would have been difficult to definitely separate the species in any one collection without additional material, and so from a number of sources something over two hundred and fifty specimens taken at many points in the eastern United States and a few from the western and southwestern portions were gathered together.

Having established the identity of Say's *pruinosa* and reached the conclusion that *tibicen* did not occur in North America at all, the description and figure of *lyricen* left no



1. Genitalia of *C. marginata* Say; 2. *C. pruinosa* Say; 3. *T hieroglyphica* Say; 4, *C. daviti* nov. sp.; 5. *C. canicularis* Harris, from side; 6, from below; 7, *C.* sp. indet, from below; 8, same, from side; 9, *C. similaris* nov. sp.; 10, *T. noveboracensis* Em; 11, *T. septendecim* Linn.; 12, *C. lyricen* DeG.



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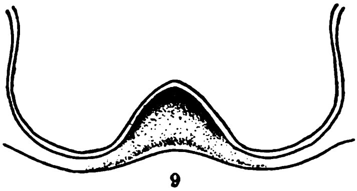

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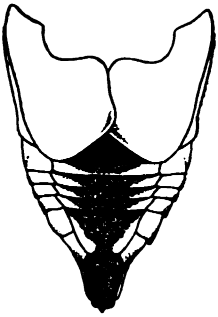

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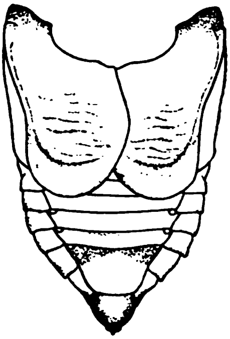

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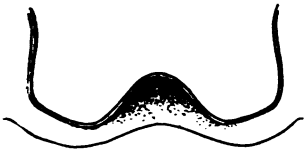

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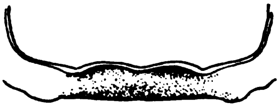

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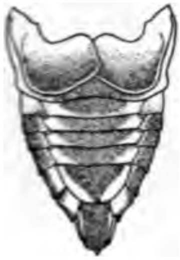

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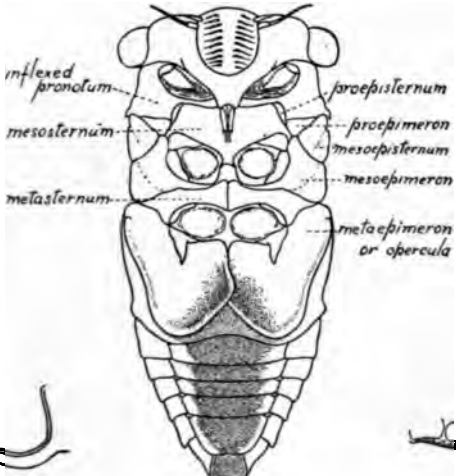

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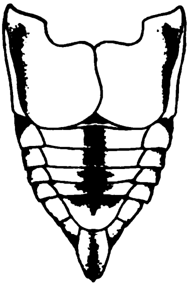

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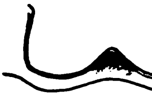

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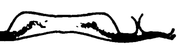

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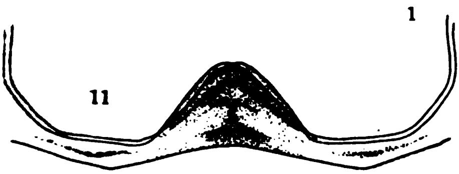

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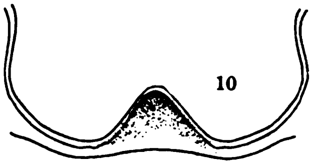

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1, *C. pruinosa* from beneath, the appendages removed and thoracic sclerites named; 2, abdomen of typical *C. linnei*, with opercula attached; 3, *C. canicularis*; 4, *C. lyricen*; 5, *C. sayi*; 6, *C. davisi*; 7, 1st and 2nd ventral abdominal segments of typical *C. linnei*; 8, *C. canicularis*; 9, *C. sayi*; 10, *C. lyricen*; 11, *C. marginata*; 12, *T. septendecim*; 13, *T. hieroglyphica*.

doubt as to the species intended and consequently *C. fulvula* Osborn falls into synonymy. *Canicularis* Harris is sufficiently well characterized to enable the species to be recognized with certainty. Having thus disposed of or identified all the published names we are free to name all other forms that are specifically distinct from them.

Cicada linnei is proposed for the species which has so long been known as *tibicen.*

Cicada sayi is proposed for the form hitherto erroneously known as *pruinosa.*

Cicada davisi, so called in honor of Mr. Wm. T. Davis, whose article induced the present critical study, is proposed for a very distinct little species which has been confused with *canicularis.*

Cicada similaris is proposed for a Floridan species, close to *lyricen* in general appearance, but widely variant in genitalic structure.

There are other species under our observation from the U. S. N. M. collection, which will eventually have to be named; but which we do not describe, partly because of the scant material at hand and principally because they are quite without the scope set for this study. The genitalia of one of these species from Mexico is figured, pl. III, f. 7 and 8, to illustrate the amount of variation displayed by members of the *tibicen* group.

There is considerable difference between species in a number of structural details, but most of them are subject to some variation. These differences may be used to good advantage for the separation of species, though in a few cases the variation is so great as to leave almost no definite line of demarcation between closely allied species when only one character is used. For the purposes of specific separation no structures are of more importance than the male genitalia, which in the Cicadids are large, strongly chitinized and easily examined. They are absolutely constant in form, however subtile certain processes may be, and are always to be relied upon. The uncus shows the greatest diversity of form. In the usual type it is broad above, with parallel lateral margins, and from the side is narrow, slightly constricted a short distance from the base, and there tapered evenly to the apex. From the side it may appear pointed as in *canicularis*, pl. III, fig. 5; or capitate as in *marginata*, fig. 1; or subapically dilated as in *davisi*, fig. 4. In *similaris*, fig. 9, it has two spinelike processes on the under side, which together show as one from the side. An extreme form from Mexico (sp. indet.) is represented in figures 7 and 8, where it takes the form of a pair of curved horns. The large side pieces also show some difference in shape, though less than in the uncus.

The opercula afford good characters. Usually they vary but little, the single instance of great variability being in *canicularis*, which merges into the opposite extreme of *linnei*. Even the color of these structures is of some importance.

The first and second abdominal segments below are intimately united and appear almost as one, the first bordering the anterior margin of the second. Taken together they differ considerably in the various species, the greatest variability in any one species again showing in *canicularis*. The figures of *linnei* and *canicularis*, pl. IV, figures 7 and 8, though drawn to one scale, represent large and small specimens, respectively—the average size of each species—with size eliminated, the difference is not as great as at first appears; consequently, the amount of variation needed to bring the two forms together is not really so great. The last ventral abdominal segment, used by Davis and Joutel in their separation of *linnei* (*tibicen*), *canicularis* and *sayi* (*pruinosa*), are also of value.

The thoracic sclerites offer practically no differences in shape within generic limits. We have lettered these sclerites (pl. IV, fig. 1), using *pruinosa* for this purpose, but the result is not entirely satisfactory and some changes may have to be made. The prosternum lying between the front coxæ is hidden beneath the lower part of the head. The mesosternum is a large, broadly pentagonal sclerite, just anterior to and partly between the second pair of coxæ. In the prothorax, the large lateral pieces, immediately posterior to and at the sides of the front coxæ, are an inflexure of the pronotum. The two small sclerites posterior to it represent the propleural sclerites - the proepisternum and the proepimeron. Both pleural pieces of the mesothorax occupy their proper places and are very little modified. The association of the names with sclerites is somewhat doubtful in the metathorax, and the notes here given are to induce observation. Dr. Sharp, in the Cambridge Natural History, speaks of the opercula as enlargements of the metepimera, and we have so designated them.

In the structure of the female we merely show the ovipositors of a few species—*marginata, linnei* and *septendecim*. The differences between them are not great; in *marginata* the basal portions are proportionately much larger than in *linnei*, which is taken as the type form, and the apical portions correspondingly shorter; in *septendecim* the structure is much as in *linnei*, but the entire organ is proportionately shorter. One of the side pieces of the tip of the ovipositor of *septendecim* is figured, highly magnified to show the hooks by which the splint is pulled out from the slit made in the twig.

Cicada pruinosa Say.

Length—♂, 33 mm., to tip of wing 49 mm.; ♀, 30 mm., to tip of wing 48 mm.—Head black, anterior margin on each side of clypeus and posterior margin between ocelli and compound eyes green; center of upper portion of clypeus with an elliptical green spot. Pronotum largely green, with two broad black marks beginning at anterior margin and becoming attenuated posteriorly where they join, inclosing a green, somewhat diamond-shaped spot; two other marks originate back of eyes and curve posteriorly toward the center; posterior and lateral margins wholly green. Mesonotum green, with black marks distributed as follows: On each side of center, beginning at anterior margin, is a broad mark which becomes slightly narrower and rounded posteriorly and ends before middle; a second mark narrowly separated from the first begins broadly at anterior margin, becomes greatly attenuated and sometimes divides as it proceeds posteriorly, then broadens abruptly and terminates just before the posterior margin; a third near the lateral margin begins as before and joins the second mark posteriorly; in center of posterior portion of mesonotum is a large mark, rounded posteriorly and extending in a point between the two central marks of the anterior portion. Abdomen above black, base of first segment with a white, heavily pruinose lateral dash, which encroaches to some extent upon the second segment; a similar but longer and broader lateral dash extends along the base of the third segment and a spot of the same color is on each side of the eighth segment. In the female the dash of the second segment differs from that of the male in not becoming attenuated dorsally, but in being squarely truncated; the spot on the seventh segment also extends on to the following segment—that which ensheaths the ovipositor—and is apparent from above. Beneath the abdomen is pruinose on pleura and sides of sternum, the central portion shining black. The opercula are as broad as long, excluding the extension beyond the coxal cavity, and overlap slightly in the center.

Habitat.—Anglesea, September 8th; Cape May County, September 20th, and Bayside, October 21st,—all in New Jersey.

This is the most invariable of the species before us, as far as can be judged from the eight examples (7 ♂ and 1 ♀) studied. The thoracic markings are well defined and illustrate the type of maculation of this group. The abdominal ornamentation also is identical in all specimens of one sex.

Cicada sayi nov. sp.

Length.—♂, 30-35 mm., to tip of wings 45-53 mm.; ♀, 28-34 mm., to tip of wings 43-51 mm.—Head black, except for a small green spot just inside the compound eyes; upper portion of clypeus usually all black. Pronotum green, with two marks, sometimes broken, which begin broadly on anterior margin, become narrow and join posteriorly, forming a distinct V; lateral and posterior margins usually black, sometimes with a green spot on each side of the center of the latter, which may broaden or lengthen or, rarely, involve the whole margin save for a small central and lateral mark. Mesonotum black, with a fulvous background showing more or less plainly and the maculation always partaking of the general pattern described for *pruinosa*. Abdomen black, with a large white pruinose spot on each side of the first segment. Beneath, the entire body excluding the legs, heavily pruinose. The opercula are very large, longer than broad and overlap considerably in the center. The genitalia are similar to that figured for *C. fulvula*; the uncus dilated and truncated apically.

Habitat. Ranges from New York southward to Alabama, and westward to the Mississippi River; in the vicinity of New York and New Jersey from mid-July to early October; Kentucky, May; Mississippi, early April. The dates for the Southern States are suggestive.

This is undoubtedly the most common form in the eastern United States, and probably occurs from Canada to the Gulf of Mexico east of the Mississippi, though we have no specimens outside the range given above. It is the most robust species occurring in New Jersey.

Cicada lyricen De Geer = **fulvula** Osborn.

Fifteen specimens of each sex, which agree in the main with Professor Osborn's description, are before us. With this number of individuals the range of variation is considerably beyond that given in his diagnosis. The pronotum in some is all black, except for a broad central line and the mesonotum in such is also black, with narrow fulvous lines indicating the usual pattern. In other examples fulvous is the predominating color, the black maculation being reduced; but the posterior and lateral borders of the pronotum are always black, except for a small spot which is sometimes present near the head. Green occasionally replaces the fulvous and, rarely, both are present on the same insect, the fulvous occuping the lateral portions of the mesothorax, the green the remainder of the background. The narrow pruinose line at the base of the abdomen is more often than not separated into two lateral linear spots and is rarely absent. Beneath, the black polished center with lateral pruinose borders holds true in all specimens. The opercula are as broad as long and vary in shape posteriorly from rounded or elliptical as described, to the more usual shape for this form, of a sub-quadrangle as shown in the figure. They are of a uniform pale brown color, quite different from the creamy yellow color, with black shadings, of most of the allied species. The genitalia are of the more usual form; the uncus much dilated and truncated apically.

Habitat.—New York to Florida and westward to Indiana; New York—Long Island and Staten Island, July to September; New Jersey—Normanock, July; Newfoundland, July 28; Paterson, July 14; Newark, July 27; New Brunswick, Farmingdale, August 12; Mentone, Alabama, August 10; Georgiana and Archer, Florida, July.

Cicada similaris nov. sp.

Length: ♂ 35 mm., to tip of wings 50 mm.

This species is very close to *C. lyricen,* but the great difference in the genitalia (pl. III, fig. 9) separates it at once from that species. The clasp or side piece is not very characteristic, but the uncus is curiously shaped like the head of a snake with expanded jaws, and from above the lower "jaw" is deeply cleft, dividing it into two lateral spines. The present form differs further by the lateral border of the pronotum being largely green, which may, however, occur in *lyricen* by the enlargement of the green spot near the head, and by the slightly longer opercula which extend to the end of the third abdominal segment, the border of which is also more strongly reflexed. Otherwise it comes within the range of variation displayed by *lyricen.*

Type: One male from Fernandina, Florida, collection U. S. National Museum.

This may be the species which Professor Osborn regarded as the possible male of his *fulvula,* since he speaks of the opercula having "a distinct reflexed border," while in the true *fulvula* they are not more strongly reflexed than in other species.

Cicada canicularis Harris.

Length.—♂. 27-30 mm., to tip of wings 40-44 mm.; ♀. 26-27 mm., to tip of wings, 39-45 mm. The head and thoracic markings are much like those described for *pruinosa,* but the extreme lateral mark of the mesothorax rarely joins the sublateral one posteriorly. As a rule but little variation is shown, though in a few specimens the two central anterior marks combine, forming one large spot and each of the two lateral marks join in a like manner. The posterior and lateral margins of the prothorax are green, as in the entire background of the thorax, and rarely, in heavily marked examples, there is a tendency for the anterior portion to become black. Abdomen above black, with small linear pruinose spots on the first segment in a few of the males only Beneath, the center is highly polished black, with broad white pruinose borders In the specimen from which the figure was made the pruinose border was removed, which shows the major portion of the pleura also black The opercula in typical specimens are considerably broader than long and are usually dark brown or blackish, though variations run toward larger opercula which are also lighter in color The uncus of the genitalia is slender when viewed from the side, tapers apically and is slightly swollen in the center.

Habitat.—From Nova Scotia and Lake St. George, Quebec, westward to Wisconsin and Iowa and southward to Washington, D. C.; mid-August to mid-October.

This form probably occurs throughout the northern United States east of the Mississippi River.

Cicada linnei nov sp

Length.—♀, 31-34 mm., to tip of wings 45-50 mm., ♂, 29-33 mm., to tip of wings 44-48 mm.

This species has been regarded as the *tibicen* of Linnæus. Typical specimens are widely different from specimens typical of *canicularis*, but occasional examples occur which are almost intermediate and are difficult to place correctly. In the large number of both species before us, however, the few such forms compared with the large number which are recognized at a glance leaves small room for doubt as to there being two species. *Linnei* differs from *canicularis* chiefly as follows: By the greater size of the individuals and the more prominent eyes; by the thoracic markings, the component parts of the pattern of which are not so closely set as in *canicularis*, thus showing a greater amount of the green background; by the comparatively larger size of the basal spots of the abdomen of the male (there are none in the female); in the greater comparative length of the second abdominal segment of the male, and in the longer opercula, which are usually as long as broad and almost always light in color. The genitalia are like *canicularis*.

There are a few male examples in the series before us which lack the pruinose spots at base of the abdomen, but these seem to have been in alcohol, which causes the disappearance of such spots.

Habitat.—This has probably the same range as *canicularis;* specimens before us show its occurrence from Boston, Massachusetts, westward to Michigan and Illinois, and southward to Tennessee and Black Mountains, North Carolina, early August to mid-September.

Cicada davisi nov. sp.

Length—♂ and ♀ 29-31 mm., to tip of wings 42-45 mm.—Head black, anterior margin betwen the eyes and clypeus and a spot in the center of the clypeus green. Pronotum including posterior and lateral margins green except for a single pair of black marks which begin at the anterior margin immediately behind the eyes, become suddenly broad, then taper posteriorly, but do not join as usually do the corresponding marks in *canicularis;* the dilation also begins much farther from the anterior margin, which in *canicularis* is so close as to be separated only by a narrow line of green; the space between the pronotal sulcus and the posterior margin is much longer than in *canicularis*. The mesonotum has markings similar to *canicularis*, but the median posterior spot is much shorter, leaving a broad space of green; the two lateral pairs of marks are fused together. The abdomen is black, without white spots at the base. Beneath it is pale yellowish, probably pruinose in fresh specimens, with a narrow black portion in the center and the pleura also are sometimes black The opercula are about as broad as long, rather convex and uniformly pale yellowish in color. The uncus of the genitalia is stout and dilated subapically.

Types: ♂ and ♀, in the collection of the New Jersey Experiment Station; co-types in U. S. N. M., and Acad. Nat. Sci., Philadelphia.

Described from five males and three females; Anglesea, N. J., August 25th; Paterson, N. J., September 4th; Miami, Florida, August 13th, Georgiana, Florida.

This is a very distinct species hitherto confused with *canicularis.* It may be separated at once from that species by the greater width of that portion of the pronotum posterior to the transverse sulcus, by the shape of the black marks on the anterior portion of the pronotum and by the comparatively narrow black central portion on the under side of the abdomen.

Cicada marginata Say.

This, the remaining species of *Cicada*—using the term within generic limits—in New Jersey, is so distinct from anything else that a detailed description of it at this time is unnecessary. It may be recognized by its large size, averaging over 40 mm. to tip of abdomen, and over 60 mm. to tip of wings, and its exceedingly robust form. The thoracic markings illustrate the general type of maculation, and the body above as well as below is largely pruinose. The opercula of the male are broader than long, pale green covered with white, pruinose and the anal abdominal segment below is considerably broader than long. The male genitalia are chunky, with the uncus knobbed at the apex.

It occurs commonly in the southern portions of New Jersey, more rarely northernwardly, and is recorded from New York to the Gulf States and as far west as Utah.

Plate III, figures 7 and 8, illustrate the genitalia of a Mexican species of Cicada, which we have not attempted to identify and present merely to show the variation of the structure in the genus. The specimens were sent from the U. S. N. M., with the *tibicen*, and were labelled *C. opercularis* Oliv., which, of course, they are not. It probably represents a new species.

In Plate 1, figure 10, we figure the genitalia of *Tibicen noveboracensis* Emmons, a distinct and well-marked species and not a synonym of *rimosa*, as Uhler contends. It may, however, prove to be the same as *T. canadensis* Prov., upon further study. The specimen was taken in the Catskill Mountains, July 6th, by Mr. R. F. Pearsall and kindly given us.

Studies of Thecla irus Godart and T. henrici Grote and Robinson.

By Henry Skinner.

In this journal, page 45, Vol. 18, I stated my belief that these two names represented one variable species. The statement made there has brought me additional material and has led me to again investigate the subject. Having been an ardent collector in the field for many years, and also having accumulated a large lot of material and also having determined many specimens for others, I have never been able to make out two species, one for each of the above names. *Henrici* is described in the Trans. Am. Ent. Soc., p. 174, Vol. 1., 1867. The habitat is given as from "Atlantic District (Maine! to Pennsylvania!)" a specimen from Maine is mentioned "which does not differ from a number of specimens from the vicinity of Philadelphia, except in that the secondaries show a very few white scales, very narrowly arranged, edging the secondaries linearily along external margin." They also say, "This species is intermediate between *Thecla augustus* Kirby (*T. augustinus* Westw.) and *Thecla irus*, as illustrated by Boisduval and Leconte, and is apparently associated geographically with the former." It would, therefore, seem logical to think that *henrici* was believed to be a new species because it differed from the figure of *irus* given by Boisduval and Leconte. I do not believe that the authors knew any *T. irus* in nature. As *Thecla irus*, Boisduval and Leconte, Hist. Gen. des. Lep. et des Chen., pl. 31, figs. 5 and 6, give a somewhat crude representation of a butterfly that has rather a wide distribution over the United States. The figures show a somewhat larger butterfly than the *henrici* of Grote and Robinson, and they say *henrici* is smaller than *irus*. Coleman T. Robinson presented his collection to the American Museum of Natural History, in New York. Mr. William Beutenmuller, curator of entomology of the institution, published a list of the types in the Robinson collection.* and records that of *T. henrici*. While I had very little doubt of the identity of *irus* and *henrici*, I wished to have a specimen compared with the type and also have certain questions answered in relation to it. Mr. Beutenmuller has very kindly sent me the following information:

"The type of *henrici* is apparently a female (body missing). It has no stigma on the upper side of the forewing. It has tails on the hind wings like your Nos. 1, 2, 3, 4. Our type agrees with your No. 1 in color and markings on the upper and under sides, except that your specimen has a little more white on the line on the forewing beneath. It expands 27 mm. It is absolutely the same species as your No. 1. The locality is Philadelphia, and labeled *henrici* G. & R. in Robinson's handwriting. It is from the Grote and Robinson collection."

It will be noted that the type came from Philadelphia. If there are two species of *Thecla* found here that might be designated as *irus* and *henrici*, I have failed to discover the fact. It will be interesting to see what others think of the two. Wherever there is great lack of unanimity of opinion, the validity of species is open to question. Mr. W. H. Edwards in his Catl. of Diur. Lep., published in 1877, puts *henrici* as a variety of *irus*. In his Catalogue of 1884 he lists it as distinct from *irus*. Strecker (1877) puts it as a variety of *irus*, and says, "smaller. Inferiors tailless." S. H. Scudder, in his Butt. East. U. S. and Can., puts *henrici* as a synonym of *irus*. J. H. Cook, Can. Ent. page 216, 1905, contends that *irus* and *henrici* are distinct species. There are others who have written on the two names, but have probably not investigated them. In the above we see *henrici* as a valid species (Cook), as a variety (Edwards), and as a synonym (Scudder).

In size the species (*henrici-irus*) varies considerably. The largest specimen I have measures 33 mm. (♀) in expanse, and the smallest 27 mm. Thirty mm. is about the average size. The male, figured by Bd: and Lec., measures 33 mm. and the female 36 mm. I have not seen any specimens with so great an expanse, although I have a number from the Southern States. The size given by Bd. and Leconte probably represents artists' license. All measurements are from centre of body at base of wing to tip, doubled. The color above varies from light greyish brown to dark brown and fuscous. Individual specimens have varying amounts of chestnut brown on the wings, from the merest trace on the secondaries at the angle of the wing to the whole upper surface of both wings entirely chestnut brown. Some have the discal areas chestnut brown, and in some the outer halves of both wings are of this color. This variation is also seen in *niphon* and *augustus,* and is common in the females. It has no specific value, and is so variable as to be of little use in constituting a variety.

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*Bull. Am. Mus. Nat. Hist., Vol. IV., p. 59.

The stigma. This is a male secondary sexual character that occurs in some males and not in others. This not only applies to *irus-henrici,* but to some other species in the genus. It has no generic or specific value, and is simply an individual variation.

The under side of primaries. We have here a line running from the costa to the first median nervule. It is also very variable and it has no specific value. It varies as to distinctness, and in some specimens it is obsolete. In some cases it is a straight line; in some, interrupted in the middle, and in some, it is as described by Cook, a series of short dashes. It has no specific value and no proper correlation with other so called specific characters given by Mr. Cook.

The under side of the secondary wing is also divided by a more or less distinct line running from the costa to the inner margin. At the costa and at the termination of the line, it is generally white, and between these points the white is very variable, in some cases an entire white line from costa to inner margin. In some cases it is more or less obsolete. Some specimens have a small basal area of gray (see fig. of Bd. and Lec.), and in some the entire inner half of wing is unicolorous and the intensity of color in this varies greatly, being in some cases light brown, and in others almost black. Crossing the wing in the centre of the outer area (the area beyond the mesial line) is a more or less distinct row of spots. The hind wings have a small tail. In specimens from Texas there is almost no differentiation between the outer and inner half of the wing by the mesial line, and this line on primaries is more or less absent. There is no correlation between any of these characters given above.

Thecla arsace Bd. Lec. is the same species as *irus*, the differences being varietal only. The figure is very poor, but I have some specimens agreeing with the description. It is a large Southern variety.

Distribution of my specimens.—New Hampshire; Lonsdale, R. I., iv. 27; v. 2; Johnston, R. I., v. 12, v. 26; Philadelphia, Pa., v. 4; Clementon, N. J., v. 7; Almonessen, N. J., iv. 28; Westville, N. J., v.; Anglesea, N. J., iv. 26; Falling Spring, Ill., iv. 12; Cincinnati, O., iv. 15, v. 20; St. Louis, Mo., iv. 21; Round Mountain, Texas; ii. 25, iii. 25; North Carolina; Louisiana. I have not seen any specimens from Canada, and would like very much to have specimens from the North and the Pacific Northwest. Sufficient allowance has not been made in our studies for individual variation. There are certain kinds of variation, individual or varietal, and other kinds specific. The basal area on the underside of secondaries of *irus* varies wonderfully in color and is a common type of individual variation in butterflies. A similar variation is seen on the upperside of *Argynnis cybele*, where the inner area is almost completely suffused with black. Numerous specimens and accurate data will elucidate many problems that confront us, brought about by the lack of material and data of the early students and writers. From the evidence before me I am convinced that *Thecla irus* and *henrici* are one species.

MR. W. H. VOLK, who has been conducting experiments for the University of California against the codling moth in Watsonville, has been appointed joint entomologist of Santa Cruz and Monterey Counties.

H. J. QUAYLE has returned from the Iowa State Agricultural College and has accepted the position of Field Assistant in Entomology in the University of California.

The Dipterous Genus Scellus, with one new Species.

By J. M. Aldrich, Moscow, Idaho.

This small genus, with *Hydrophorus* and *Liancalus*, forms a distinct subfamily of the Dolichopodidæ, characterized by having the last section of the fifth vein shorter than the posterior crossvein, the hairs of the back of the head below forming a scattered beard (instead of a ruff in a single row bordering the eye), and hypopygium directed backward or downward, not turned forward under the venter.

Liancalus is readily distinguished from its near relatives by having slender fore femora and elongated fore coxæ. The difference between *Hydrophorus* and *Scellus* is not very striking when written down, but easily recognized in nature. *Scellus* has long spines on the under side of the fore femora, and distinct, narrow longitudinal lines on the thoracic dorsum; *Hydrophorus* has only small spines on the under side of the fore femora, and the dorsum unmarked with lines, or with very slight ones. The species of *Hydrophorus* always frequent the edges of water, and are often seen running over its surface. *Scellus*, however, is never seen at water, but is found on bark of trees, on the ground, or in grass (exceptionally, perhaps on stones).

Only six North American species of *Scellus* have been described, to which another is added in the present article.

Scellus virago new species.

Large species, with yellowish-brown wings and greatly elongated antennæ, with apical arista.

Male. Head densely yellowish-brown pollinose, the face more ochre yellow; eyes elongated vertically, the face slender; about eight black bristles behind the eye above, and a pair on the occiput; antennæ inserted high up, as long as the vertical diameter of the eye, slender, the third joint nearly twice as long as the first two, with a short, two-jointed, apical arista.

Thorax thickly dusted, still with a faint coppery or rosaceous reflection showing through on dorsum and sides. Pollen of the dorsum grayish in the middle, with two very fine lines in the center, enclosing the single row of six or eight tiny acrostichal bristles; dorsocentral bristles in two rows, very small, except the posterior two of each r with slight dots from which the separate bristles arise; along e side of the dorsum a darker pollinose stripe above the pleural sutu before the scutellum a median darker stripe, continuing the two median lines to the scutellum (the insertion of the pin prevents describing this more closely); scutellum more bright coppery with two bristles; pleura uniformly and densely pollinose with g the coppery ground color but little visible. Halteres yellow.

Abdomen less pollinose and more coppery than the thorax, of f well-developed segments, the others modified; fourth segment o third as long as the preceding one; the "anal appendages" arise the dorsal side, between the fourth and fifth segments—they ar pair of delicate organs, black at base, whitish beyond, each ending in spoon-shaped, orange-colored enlargement, which bears a dense se of small, dark hairs along the outer side and a tuft of similar o on the inner apical angle; third abdominal segment protuberant beh the grasping organs of the hypopygium projecting behind it.

Legs blackish-green, somewhat pollinose, of complicated structu Fore femora with the usual spines beneath; fore tibiæ with a r of stiff hairs on the inner side beyond the middle and a stout thum like curved claw on the anterior side before the end; also, with striking lobe or lappet on the inner side of the tip. Middle fem slender, a little arcuated; middle tibiæ with a row of erect bristles the anterior side past the middle, and curled long hairs on the poster side at the tip. Hind femora, tibiæ and tarsi of plain structure, tibiæ without noticeable bristles at the tip.

Wings brownish-yellow on the basal half, more brown apically, large brown spot on the posterior crossvein and another on arcuation of the fourth vein, before and beyond the latter vein widely bordered with yellow. Length, including appendages, 7 mm of wing, the same.

Female. Antennæ much shorter, the third joint only a little long than the other two, arista apical, a little longer than in the ma Abdomen of five equal segments. Legs destitute of striking modi cations, however, the spines under the fore femora are as large as the male. Wings as in the male. Length, 7.2 mm.

The type is a male, collected by myself, October 11, 190 in the salt marshes nearest to Palo Alto, Cal. It was stalki over the ground in a bare spot, and looked more to me like Tipulid than anything else.

I have also a male and a female cotypes, collected in th same vicinity by R. W. Doane, on October 11, 1906. I studied the courtship of the species at that time. (*Vide poste* page 136).

NOTES ON THE DESCRIBED SPECIES.

Scellus exustus Walk. This large, black species is so striking that there can be no doubt that it was the one described by Walker, although he mentioned only a few of its characters. I have specimens from Brookings, South Dakota, Montana, and Moscow, Idaho. I have only collected it in beating about the grass of low meadows, and have never seen a specimen before I got it into my net; hence, I do not know its exact habitat.

Scellus avidus Loew. This I have only seen in a set of specimens given to me by Professor Wm. M. Wheeler, collected by him September 11, 1895, on Hunter's Creek, Wyoming. The type locality was Fort Resolution, Hudson's Bay Territory. It is one of the larger species, the tooth on the anterior side of the fore tibia is near the base; the ribbon-like anal appendages are white, blackish at base and tip, with a tuft of brown hairs on the end of the black, spoon-shaped apical part.

Scellus spinimanus Zetterstedt. This European species was recognized by Loew in material from Fort Resolution, Hudson's Bay Territory. As far as I know, no one has seen it from North America since. It should be easily recognizable.

Scellus monstrosus O. S. I examined a male of this species in the University of Kansas collection, captured at Estes Park, Colorado; it is the only specimen I ever saw. The type locality was British Columbia. It has many characters in common with *virago,* differing in the antennal structure and in having a long, curved spine at the apex of the hind tibia, etc.

Scellus vigil O. S. Type locality, Webber Lake, California, "resting on stones on hillsides." No other species of the genus is known to rest on stones, and I found this rather common ten years ago in the vicinity of Moscow, Idaho, on trunks of pine trees; hence, I am a little doubtful about the data of Osten Sacken. I also got the species on the side of the university building, however. It is a small species, with pale wings. I have got no more specimens for some years now.

Scellus filiferus Loew. I collected this at Custer, South Dakota, on pine trunks, and near Moscow, Idaho, in the same situation. It was not common in either locality, and I have not found a specimen in ten years.

I wish the few remarks above about the habitat of species of this genus might interest collectors in scanning trunks of trees more closely. Not only *Scellus*, but *Medeterus* and *Neurigona*, of the Dolichopodidæ, are found there, as well as flies of other families.

Students of secondary sexual characters could not find a more interesting group than *Scellus;* for lack of space, I have not half described the peculiarities of the male in *virago*, and all the species have nearly as many male characters.

TABLE OF SPECIES OF SCELLUS, BASED ON THE MALES.

1. Third antennal joint elongated, with apical arista . . . . **virago** n. sp.
   Third antennal joint not elongated, with dorsal arista . . . . 2.
2. Hind femora greatly thickened and arcuated, wings wholly blackened. **exustus** Walker.
   Middle femora arcuated, thickened towards the middle, wings not entirely blackened 3
   Middle and hind femora not arcuated . . . . **avidus** Loew.
3. Apical half of the wings black, thorax above with snow-white pollen. **spinimanus** Zetterstedt
   Not as described . . . . 4.
4. Anal appendages terminating in spoon-shaped, orange colored enlargements . . . . **monstrosus** Osten Sacken
   Anal appendages not enlarged at tip . . . . 5.
5. Hind femora along the middle with abundant, long white pile . **vigil** Osten Sacken.
   Hind femora without white pile . . . . **filiferus** Loew.

Notes on the Habits of Scellus virago Ald.

By R. W. Doane, Stanford University.

The broad salt marshes bordering San Francisco Bay near Stanford University are for the most part covered with the common salt grass (*Salicornia ambigula*), but here and there are larger or smaller spots entirely devoid of any vegetation and glistening white with a thin encrustation of salt. These are favorite places with many of the insects that live on the marsh, seeming to be a sort of general rendezvous, where they can bask in the sun, carry on their courtships or build nests in the sand or clay, and, incidentally, be killed or eaten by their larger or stronger neighbors.

While collecting on one of these places in October, my attention was attracted by the peculiar actions of a long-legged fly which was running nervously over the ground. Its movements were all quick and jerky, running three or four inches, then stopping and spreading the wings out horizontally and folding them over the back again, repeating the operation several times in rapid succession, sometimes squatting low, sometimes rising high on tip-toe. Sometimes it would fly short distances, but always on alighting would go through these same jerky movements. Now and then, in its running about, it would come close enough to one of the little *Agromyzids* (*Rhicnoessa parvula* Lw.), that were quite abundant here, to pounce upon it and suck its blood. The unfortunate little fly is held and manipulated by the fore-legs of its captor, and after being turned over a few times, evidently in order that the blood may be sucked from different parts, the empty skin is dropped to the ground and blown away by the wind, while the vampire goes in search of another morsel.

While watching one of these flies, which proved to be a female, she seemed suddenly to become very much excited, now squatting low, now rising high and waving the wings frantically. The cause of this extra excitement was a male fly which, unnoticed by me, had approached to within a few inches of the female. He seemed to be paying but little attention to her, but was running about much as she had before he appeared. He gradually worked near her, however, and for some little time they stood facing each other, going through the curious performance of raising and lowering their bodies and waving the wings frantically. The male then turned away and seemed about to leave, but the female quickly flew in front of him again and began her antics. Several times this was repeated, the male sometimes flying away for a considerable distance; but whenever he came near the female, again she would run in front of him and begin waving her wings. Finally the female flew directly to the male, and I think that copulation took place, although I could not tell definitely. The male then flew away, not to return while I was watching. This same performance, with slight variations, was seen to take place between four different pairs of flies; but only in the first instance did copulation take place.

As in many other of the Dolichopodidæ, the males of this species have very striking sexual characters, enabling the sexes to be easily recognized, even at some little distance. The long, ribbonlike anal appendages are reddish or orange-yellow, somewhat twisted, and with the tips broadened or spoon-shaped, making, indeed, a very conspicuous flag or pennant. The fore tibiæ are somewhat enlarged and furnished distally with a large, blunt protuberance. The spines on the distal half of the middle tibiæ tend to become more curly until toward the end there is quite a tuft of curly hairs.

According to observations made by Dr. Aldrich and others on other species of Dolichopodidæ (American Naturalist, 1894, page 35) and according to Darwin's theory of sexual selection, we would expect the male of this species to parade these sexual adornments before the female to attract or excite her. While it is probable that they may serve as recognition marks, enabling her to distinguish a male from another female, they are certainly not paraded before her for this purpose, as in other species. On the contrary, the male seems to take no particular interest in the courtship carried on so aggressively by the female, allowing her to make nearly all the advances. In a few instances the male would alight in front of the female, but seemed to make no effort to display his charms, nor would he begin the rythmical vibration of the wings until the female had evidently in this way first attracted his attention.

Dr. Aldrich identifies this fly as an undescribed species of *Scellus*, and describes it under the name of *Scellus virago*. (*Vide antea*, page 133.)

◆

Professor Arthur B. Cordley recently paid a visit to California, where he attended the Hanford Fruit Growers' Convention.

The fruit growers of Southern California have asked Dr. Howard to delegate some one to investigate the fumigation of citrus trees in that part of the State. This is a very important work, involving interests amounting to very large sums

Annotated List of the Species of Chrysops occurring in New Jersey and Descriptions of two New Species.

By Erich Daecke, Philadelphia.

(Plate VI.)

Since the publication of the New Jersey State List of Insects, by Prof. John B. Smith, in 1899, in which were recorded sixteen species of *Chrysops*, the number of species in this genus has been more than doubled. The local interest taken in this genus, as well as in other genera, families and orders, can be traced directly to Prof. Smith's list, which not only served many local collectors as a check-list, but stimulated their work to no small degree. It indicates the value and even the necessity of State lists.

The wing picture is an excellent differentiating character in the genus *Chrysops*, hence I have figured the wing of every species so far collected in New Jersey, avoiding extreme and perplexing forms which at times will occur.

The figures are three-fold enlargements from average wings, and the difference in size of figures gives the relative proportion between the species. All the figures represent the wings of females.

1. **C. excitans** Walker.

One specimen out of a large series from Bamber, v, 27, has anal cell open. The yellow on sides of abdomen extends to the third, rarely the fourth, segment on the South Jersey specimens. Mr. William T. Davis has collected *excitans* at Lakehurst, VI, 15.

2. **C. celer** Osten Sacken.

Common everywhere, from middle of May to beginning of July. Specimens worn by flight often lack the characteristic fulvous pile on pleura, and are easily mistaken for *mitis*, and if such specimens happen to have the fifth posterior cell entirely hyaline, as I have occasionally found on some specimens of *celer*, as well as on some specimens of *carbonarius*, they may also be mistaken for the latter. The broad and spatulate grayish-white space between the facial callosities of *celer*, which is narrower on *mitis* and almost linear on *carbonarius*, will be of value. The difference of infuscation on second basal cell also serves well as a differentiating clue. See figures.

3. C. carbonarius Walker = fugax O. S.

Not rare in South Jersey. The extreme dates of my captures are Lacy, V, 27, and Da Costa, VI, 15. Miss Ricardo has placed *fugax* O. S. in the synonymy after examining the tion, but the student not familiar with this species must necessarily read the description of *fugax* O. S. to understand what *carbonarius* Walk. is supposed to be.

4. C. mitis Osten Sacken.

Two specimens, one in Mr. Harbeck's collection, Jamesburg, July 4th; another in my collection, Brown's Mills Jc., June 25th. These two specimens are smaller than the normal *mitis* and may possibly be freaks of *celer*, though, according to all recorded characters, they belong to *mitis*. The eyes of these two specimens are like those of *celer*, that is, with shaft present. I have examined the eyes of Baron Osten-Sacken's type of *mitis* in the Academy collection, and they correspond with those of *carbonarius-fugax*, that is: shaft absent. See Plate I, ENT. NEWS, Vol. XVII.

Mitis is very closely allied to *carbonarius* and may possibly be a variation of same. Mr. Whitney writes me: "The typical *mitis* is extremely rare here (Milford, N. H.), although *fugax* is abundant in variety almost to the *mitis* type. I have no faith in their separateness."

5. C. cuclux Whitney.

Only recorded by Mr. A. J. Weidt from the Orange Mountains in May.

6. C. niger Macquart.

Common everywhere, May 12th-July 4th.

7. C. brimleyi Hine.

This species appears about the end of May and is a typical pine-barren insect.

8. C. amazon Daecke.

This species is rare, even in its type locality. Brown's Mills Jc., end of June—beginning of July.

9. **C. nigribimbo** Whitney.

About the end of June till September, all through the pine barrens.

10. **C. plangens** Wiedemann.

This species is common along salt marshes. Anglesea, May 28th, Newark meadows, June, A. J. Weidt. Staten Island, June 3-10, Wm. T. Davis.

11. **C. fallax** Osten Sacken.

Locally common. Wenonah, June 22; Jamesburg, July 4th.

12. **C. moechus** Osten Sacken.

I have never seen this species in numbers, but Mr. Harbeck records it to be the most common species near Trenton about the first week in July.

13. **C. univittatus** Macquart.

Locally a pest along the edges of woods. My extreme data are from Wenonah, June 14th to July 15th.

14. **C. bistellatus** Daecke.

This species I have only taken so far at its type locality, Brown's Mills Jc., from end of June to middle of July.

15. **C. indus** Osten Sacken.

Rare in New Jersey. I have only taken it at Clementon, from which locality it has been previously recorded by Mr. Johnson and Mr. Harbeck, May 10 to 15. Mr. Wenzel has taken one specimen at Almonessen, May 20th.

16. **C. vittatus** Wiedemann.

A widely distributed and rather common species. Brown's Mills Jc., June 24th; Wenonah, July 27th; Lucaston, Aug. 6th; Bamber, Sept. 1st.

17. **C. striatus** Osten Sacken.

This species is rare in New Jersey, and in local collections it is not uncommon to find *sequax* and *hinei* (a new species described in this paper) under the name of *striatus*. Delair, Aug. 7th.

18. **C. sequax** Williston.

The New Jersey specimens have a yellowish frontal callus, margined with black; the types from western Kansas are described as having a black frontal callosity. There is no other perceptible difference. Wenonah, July 27th.

19 **C. lugens** Wiedemann.

The only two New Jersey specimens on record were collected by Mr. Harbeck at Trenton, July 5, 1906. This species belongs to the Southern Atlantic and Gulf States, where it appears to be smaller and darker.

***C. lugens* var. *morosus* Osten Sacken.**

Bamber, July 9; Tom's River, July 12; Newbold, ♂ ♂; July 14, ♀ ♀, July 21. Baron Osten-Sacken was familiar with Dr. Wiedemann's description of *lugens* when he described his *morosus* as a new species, and stated in his Prodrome, page 394, that he had never seen *lugens*. These two forms are apparently distinct; the descriptions bear this out, but Prof. James S. Hine has in his collection the complete chain of intergrades, hence *morosus* must be considered a variety of *lugens*. The wing, Fig. 19, answers for both forms, *lugens* and *morosus*. While studying these forms I collected more than 125 specimens, with the result that two new species were separated from this group, of which a table may read like this:

lugens, abdomen brown, one yellowish longitudinal line.
lugens, var. *morosus*, abdomen brown, three brownish yellow stripes.
parvulus n.sp., abdomen altogether brown.
hinei n. sp., abdomen orange, two blackish stripes.

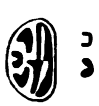
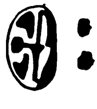
20. **C. parvulus** n. sp. ♀.

Length 5½-7 mm. Face brownish-yellow; facial callosities, cheeks, and frontal callus black; front covered with grayish pollen. First antennal segment yellowish, second segment basally brown, the rest black. Frontal spot on eyes more or less excised anteriorly; occipital border separated from occiput. Thorax brownish black, sparsely covered with whitish hair; two dorsal stripes barely recognizable cephalad, and this only in a certain light. Pleura brown, with two grayish stripes, the upper one indistinct. Abdomen uniformly brown, sparsely beset with whitish hair toward apex. Venter uniformly brown and glossy. Front tibiæ, except the base, also tarsi, dark brown; middle legs brownish yellow, except the tarsi apically dark brown; hind legs, except base of tarsi, base of tibiæ, and apex of femora, dark brown. Wings. Costal cells and first basal, except a small spot near apex, brown, the crossband fills out the discal and fourth posterior cells, its distal convex border begins at tip of posterior intercalary and touches the first longitudinal. The apical spot scarcely reaches the third longitudinal. See Fig. 20.

Described from 98 specimens taken at Bamber, N. J., July 9, '06; one specimen, Tom's River, July 12, '04; two specimens from Jamesburg, N. J., July 4th, collected by Mr. Harbeck, and one specimen from Lakehurst, N. J., collected by Mr. W. T. Davis.

The specimens referred to by Baron Osten-Sacken at the end of his description of *C. morosus,* Prodrome, page 390, undoubtedly belong to this species. He writes: "Two females and a male, also from Maryland, are smaller, abdomen altogether brown, front tibiæ, etc., etc. I am doubtful whether they belong here."

This species would appear to be in line with the variations of *lugens*. Hypothetically, *lugens* would be the intermediate form between *morosus* and *parvulus,* but I have taken the extremes, *morosus* and *parvulus,* in great numbers at the same date and place, Bamber, July 9th, while *lugens* could not be found. Besides, I offer the following comparative diagnosis as proof of their separateness:

parvulus,	*lugens* and *morosus.*
 Size 5½-7 mm. Occipital border of eye not connected with occiput. Frontal spot more or less excised anteriorly (see fig. and variations of frontal spot). Thoracic stripes barely visible. Abdomen uniformly brown. Apical spot of wings scarcely reaches third longitudinal. Hind femora and tibiae dark brown, except extreme section of knee.	 Size 7-8½ mm. (The two N. J. specimens of *lugens* are 7½ mm.) Occipital border of eye connected with occiput. Frontal spot filled out. (See fig. and variations of frontal spot.) Thoracic stripes very distinct, abdomen striped (*lugens* one stripe; *morosus* three stripes). Apical spot exceeds third longitudinal. Apical third of hind femora also tibiae yellowish;

21. **C. hinei** n. sp. ♀.

Length 7½-8½ mm. Face, facial callosities, cheeks, and frontal callus yellow, the latter at times narrowly margined with brown. Front dark brown, with grayish pollen. The brown shining ocellar tubercle prominent. First antennal segment yellow-ferruginous, second reddish-brown, third from brown to black. Thorax and scutellum brown.

The greenish gray middorsal thoracic stripes narrowly separated, the lateral stripes yellowish-gray and more prominent in color. Two yellowish-gray stripes on pleura. Abdomen orange, with two longitudinal, well-defined brown stripes, which meet anteriorly at the scutellum and posteriorly at the fifth segment. Apical portion of abdomen tinged with brown. Laterally at base of third and fourth segments a brown spot each as if indicating an omitted stripe. Some specimens show an indistinct, pale brown lateral marking on first and second segments. Venter orange, blackish at tip, one narrow indistinct brownish stripe laterally and a broad central stripe reaching from tip to third segment. Legs yellow-ferruginous. Fore tibiæ, except base and tarsi brown; distal portion of middle tibiæ and tarsi, brown; hind femora basally, hind tibiæ and tarsi apically brown. Wings: The costal cells, first basal, discal, and fourth posterior cells infuscated. This infuscation is unbroken to the outer margin of crossband, which begins at tip of posterior intercalary and extends convexly to first longitudinal. The apical spot fills out the apex of wing, leaving but a narrow crescent for the hyaline triangle which widens posteriorly. See Fig. 21.

Described from seventeen specimens collected at Iona, Aug. 25, '02; Weymouth, Aug. 16, '04; Atlantic County, Aug. 7, and Lakehurst, Aug. 18, Prof. John B. Smith; Lakehurst, Sept. 3 and 16, Mr. Wm. T. Davis.

One doubtful ♂, collected by Mr. Harbeck, Sept. 7, '05, at Clementon, I refer to this species. Its general appearance, date of capture and locality point toward *hinei*, but I defer description to a later date awaiting more conclusive proof.

This species belongs to the *lugens-morosus* group, from which it is readily separated by the narrow hyaline triangle, the orange abdomen striped with black and the yellow callosities.

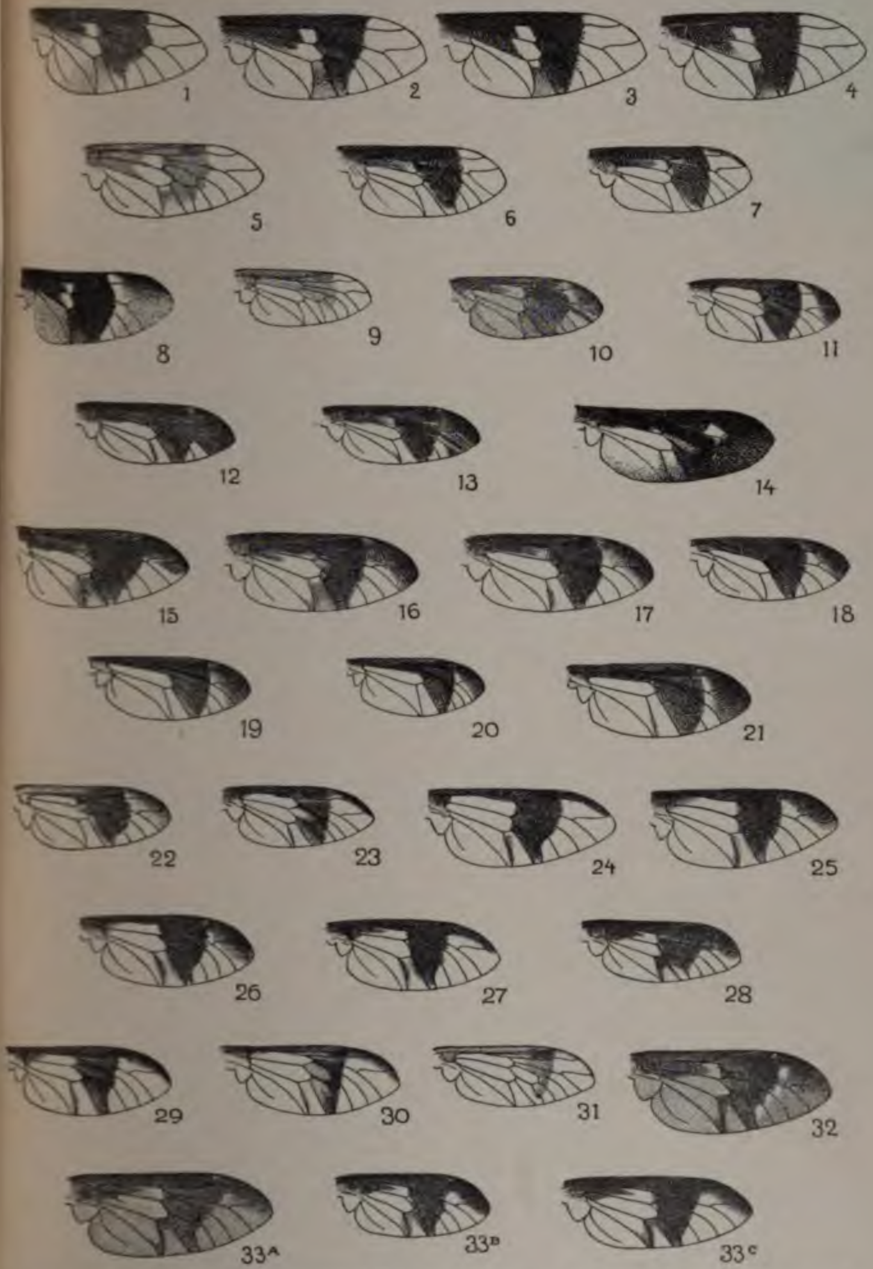
Named in honor of Prof. James S. Hine, who has added so much to the knowledge of this family.

22 **C. obsoletus** Wiedemann.

Not a common species in New Jersey. Fort Lee, June 23, Wenonah, June 22; National Park, Aug. 13.

23 **C. delicatulus** Osten Sacken

The first New Jersey specimens I collected at Tom's River, July 12, '04, and considered a rare find, but since, I have taken it all through the pine barrens. It is a typical pine barren



1, *excitans*
2, *celer*
3, *carbonarius*
4, *mitis*
5, *cuclux*
6, *niger*
7, *brimleyi*
8, *amazon*
9, *nigribimbo*
10, *plangens*
11, *fallax*
12, *moechus*
13, *univittatus*
14, *bistellatus*
15, *indus*
16, *vittatus*
17, *striatus*
18, *sequax*
19, *lugens*
20, *parvulus*
21, *hinei*
22, *obsoletus*
23, *delicatulus*
24, *callidus*
25, *dimmocki*
26, *montanus*
27, *sackeni*
28, *frigidus*
29, *pudicus*
30, *cursim*
31, *fulvistigma*
32, *brunneus*
33a, *flavidus*
33b, *flavidus*
33c, *flavidus*

DRAWN BY E. DAECKE.

species. Brown's Mills Jc., June 25; Da Costa, June 29; Bamber, July 9.

24. **C. callidus** Osten Sacken.

This is about the best known species, it is generally distributed and may be taken from the beginning of June to the latter part of July almost anywhere.

25. **C. dimmocki** Hine.

Closely allied to *callidus* but has a broader apical spot. Anglesea, May 28; Iona, June 2; Cape May, June 7.

26. **C. montanus** Osten Sacken.

Rather local and nowhere common. Clementon, June 28.

27 **C. sackeni** Hine.

Da Costa, June 3; Brown's Mills Jc., June 17; Fort Lee, July 4.

28. **C. frigidus** Osten Sacken.

Dover, June 23, Johnson. This record is taken from Mr. Chas. W. Johnson's Supplementary List of Diptera from New Jersey, ENT. NEWS, May, 1904.

29. **C. pudicus** Osten Sacken.

Da Costa, June 24; Brown's Mills Jc., June 27, July 1. I have collected many specimens of this species, but never found intergrades between this and *cursim* Whitney. The orange abdomen and pale infuscation of the wings are always characteristic of *cursim*, though the eye maculations are identical in both. Should these two forms ever prove by the final test of breeding to be the same, the name *cursim* Whitney would even then be a convenient means of separating it as a variety from its allied form *pudicus* O. S.

Pudicus is not a common insect, only once I found it in abundance near cranberry bogs.

30. **C. cursim** Whitney.

This species is rare and inhabits particularly the pine barrens. Da Costa, July 4, 1901; Brown's Mills Jc., July 1, '06; Jamesburg, July 4, '05; Harbeck, Lakehurst, June 16, W. T. Davis.

31. **C. fulvistigma** Hine.

One ♀ specimen, Lakehurst, July 29, collected by Wm. T. Davis.

32. **C. brunneus** Hine.

One ♀ specimen, Cape May, Aug. 9, 1904; Newark, Salt Meadows, both sexes, July, A. J. Weidt.

33. **C. flavidus** Wiedemann.

A common species in June, July and August. This species is very variable in size, color and wing-maculation. See Figures 33 a, b and c. In looking over a large series I find that specimens from the salt marshes along the Atlantic coast also from the Delaware River front are larger, their wings have a smoky tinge all over, the brown design is rather pale, and the crossband wider (Fig. 33 a), in a measure resembling *brunneus*. Specimens from inland localities are, as a rule, smaller, with clear wings and dark brown maculation (Fig. 33 b and c), but there seems to be no character strong or constant enough to separate these two forms specifically.

Notes on some Species of Geometrids.

By John A. Grossbeck, New Brunswick, N. J.

The notes forming the present paper have been in the hands of the writer since early in 1906, and are primarily the result of Dr. Dyar's article in the Proc. Ent. Soc. Wash., Vol. VI, p. 222, under the heading "A Few Notes on the Hulst Collection." In going carefully over the Geometrid portion of the Doctor's paper, I find that he has unfortunately relegated several of Hulst's species to the synonymy erroneously. Two of his conclusions have already been questioned,* and as a result it was believed that certain specimens examined by Dr. Dyar purporting to be types were not types at all. Such other notes as have suggested themselves in the course of this study have been added.

Hydriomena curvilinea Hulst.

Dyar says of this species: "This is the same as *H. occidens*

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*Can. Ent. XXXVII, 61

Hulst, the subbasal and outer transverse anterior lines being a little more distinct than in the type of *occidens*."

I have concluded, after close study, that *curvilinea* is distinct from *occidens* for the following reasons: the outer transverse anterior line in *curvilinea* is single, defined and edged inwardly by a whitish zig-zag narrow line, while in *occidens* the corresponding line is diffused, geminate and broad, becoming faint and the component parts merged together toward the center and inner margin of the wing, the whitish zig-zag line being wanting. In *occidens* a line beginning at the center of the costa and from thence outward and inward to center of wing is altogether absent in *curvilinea*. The outer line in both species is more or less broken and ill-defined, but at the costa it is double in *curvilinea* and single in *occidens*. These points are sufficiently strong to hold the species distinct in my opinion.

Hydriomena amorata Hulst.

Of the two types, one, a female, is probably *Petrophora defensaria* Guen. The other, which has both antennæ and the abdomen missing, but is otherwise in very perfect condition, is probably also a female. This is a different insect from *defensaria*, the entire median area of the primaries, between the intradiscal and extradiscal lines, being a bright reddish-brown, deeper in the center. There is not even a tendency in this direction in any specimens of *defensaria* I have ever seen. The name *amorata* will therefore hold, and while its generic disposition is a little uncertain, the character of the wing markings would place it in *Petrophora*.

Somatolophia umbripennis Hulst.

Of this species Dr. Dyar says: "The single ♀ type is *Alcis haydenata* Pack." This conclusion, Rev. Geo. W. Taylor would not accept, because in defining the genus of which *umbripennis* is type, Hulst gave characters which were possessed by the male only, and some of which were at variance with the genus *Alcis*. In this he was correct; *umbripennis* is not an *Alcis*, and therefore not *haydenata;* and while the character of the markings are precisely the same, the general color and the structure are quite different. I might say, also, that the type in the Hulst collection is not a female, but a male, the antennæ of which are broken off; but sufficient of the segments are retained to show the long pectinations.

In the course of the study of this species I was at first inclined to regard both it and *haydenata* as one species, and neither as belonging to *Alcis*, for, under the latter, Hulst had two males, neither of which possessed the hair pencil on the hind tibia characteristic of that genus. They also had the same umber-colored wings, and the dorsal tufting of the abdomen ascribed to *umbripennis* was the only structure which separated them. This abdomen of the type appeared to be that of a female, and Professor Smith, to whom the specimen was shown, corroborated my opinion at once and also called my attention to the fact that the body belonged to some other insect. I afterward detached the body to demonstrate this point and found positive evidence of its having been glued on. This was done very neatly, as may be inferred when we consider that it passed through the hands of Hulst, Dyar, Pearsall and myself without any of us suspecting the truth.

After these two forms were combined I at first supposed that *haydenata* had no hair pencil, but specimens in my own collection showed this structure plainly; so the question arose as to which species Packard's types belong. These types are females, but judging from his description, "uniformly pale-reddish ash gray," I do not think there can be any doubt but that he had the form with the hair pencil in the male There are three male specimens of *umbripennis* before me, and none have the antennæ entire, but I assume that they have a simple apex Thus, with the abdominal characters of *Somatolophia* eliminated, our species rests very comfortably in *Selidosema*

Cymatophora festa Hulst

Another conclusion of Dr. Dyar's is that "the single ♀ type [of *Cymatophora festa*] is *Deilinea pulveraria* Hulst," and he adds "The name *festa* has priority, but should be referred to *Deilinea*." Now, how Dr. Dyar came to say this I cannot even conjecture. The insects are so very different that the statement led Mr. Taylor to say, as he did of the former, that the specimen at New Brunswick cannot be the true type. That it *is* the true type there is not a shadow of doubt, for it agrees, word for word, with Hulst's description of the species. Upon further study, however, I find *festa* to be the same as *Macaria aequiferaria* Walk., and it should be referred as a synonym to that species.

In this connection, I might also say that there are a few other apparent discrepancies which require explanation. In the Hulst collection under the name *Macaria quadrisignata* Walk., are four specimens which are exactly like *Cymatophora festa,* or more correctly, *Macaria aequiferaria.* Referring to Dyar's catalogue we find *quadrisignata* as a good species of *Macaria* (3679), and again, following Packard (Mono. Geom. p. 285) as a synonym of *Sciagraphia granitata* Guen. (3647). Thus, if we accept Dr. Packard's decision, who compared *granitata* with the type of *quadrisignata,* we must erase the latter from our lists as a species and leave it as a synonym of *granitata;* but should the specimens in the Hulst collection be the true *quadrisignata,* then it must be placed as a synonym of *M. aequiferaria.*

We have a somewhat similar case with *Macaria dispuncta* Walk., which is given specific rank in Hulst's classification (Trans. Am. Ent. Soc., Vol. XXIII, p. 331), and in Dyar's catalogue (3687), and in the latter also, again following Packard, as a synonym of *Sciagraphia granitata.*

Selidosema correllatum Hulst.

The two types of *Macaria correllata* (not *correllatum*), referred to *Sciagraphia granitata* by Dyar, have nothing in common with *Selidosema correllatum.* They were evidently labelled by Hulst with the intention of describing; but no description has appeared under that name so far as I am aware.

The two types of *Diastictis sericeata* Hulst are both females of *Selidosema correllatum.* The ground color of the former is very light in color, and thus the fine brown striations mentioned by Hulst in his description show up more prominently than in the latter. The outer transverse lines are also less curved in *sericeata,* being almost straight.

In Dyar's list *correllatum* is placed in the genus *Cleora,* but

I can detect no hair pencil in the male; neither is it a *Cymatophora* (= *Diastictis*), as the male antennæ are plumose.

The two types of the true *Selidosema correllatum* are not conspecific; the male, from Colorado, is darker, more heavily marked, and is the one from which the original description was chiefly drawn; the female, from California, is a white insect with broader wings and the outer margin of the primaries below the falcation is more produced. The Colorado type is, therefore, left to represent Hulst's species, and the Californian specimen is herewith described as new.

Selidosema pallescens n. sp.

♀.—Expanse, 26 mm.—Ground color, creamy-white, except the upper side of the primaries, which is white. Head, palpi, thorax and abdomen with a scattering of brown scales. Primaries with dark brown scales, sparsely and pale brown-ochre ones more numerously scattered over the surface, these latter forming small squares along the inner half of the costa. Basal line brown, broadest between costa and radius, and from there is incomplete to inner margin, where it is very dark brown. Median line visible only on costa, where it appears as a brown-ochre, squarish patch, which extends slightly into the discal space. Discal spot dark brown, transversely oval, situated at end of discal space. Outer space with two widely separated brown lines. The inner begins on the costa one-third from the apex and forms a slight S to inner margin; below radius 5 to immediately before cubitus 2 this line is very faint, but is otherwise broad and distinct. The outer line begins on the costa, midway between the apex and the inner line, and extends toward inner line to media 1 and then runs parallel with it to inner margin; this line is faint in the same place as the inner line, and is also much narrower than that line. In the space between these two lines there is a small brown spot just above media 3 and a little below this is a large patch, which extends to the inner margin. The marginal line shows only between radius 5 and media 3, where it appears as three black lunules. Fringes checkered brown ochre and white. Secondaries with a scattering of brown scales along inner margin. Discal spot round, distinct. Marginal line broken, most obvious toward apex. Outer margin scalloped, each scallop tipped with pale brown. Beneath, the primaries have a scattering of ochreous scales, thickest at the costa and apex; the secondaries are peppered chiefly with brown scales, though also some ochre ones toward outer margin and at apex. Discal spot present on all wings.

Type: one female from California in the Hulst collection at Rutgers College.

Iscephera minima Hulst.

As Dr. Dyar suggests, *Gabriola dyari* Taylor is the same as this species. Mr. Taylor's generic description agrees perfectly with *minima*, so far as it would apply to the female sex.

It may be well to state, in conclusion, that the type of *Tephroclystia brunneipennis* Hulst = *Percnoptilota fluviata* Hubn. does not bear a "*Nyctobia*" label, but a *Nycterosea* label, the genus which was created for the reception of *brunneipennis*, when it was first described. This is merely mentioned to show that Dr. Hulst never considered it a *Nyctobia*, as would be inferred from Dr. Dyar's note.

◆

The Classification of the Culicidae According to Scale-Vestiture Characters.

By Frederick Knab, Washington, D. C.

Plate VII.

While, perhaps, sufficient objection has already been made to the use, by Theobald and his followers, of the scale-vestiture of the Culicidae in classification,* it seems worth while to give a few illustrations of their worthlessness for such purposes. Even could the different writers agree, as is by no means the case, on the application of Theobald's terminology to the various forms of scales, the fact still remains that the shape of the scales gives no assurance whatever of the systematic position of the insect. Moreover, the scales show no fundamental differences of structure but only differences of form, and all intergrades occur between the scale forms indicated by Theobald for generic division. This question has been so ably discussed by James and Liston that it would be superfluous to enlarge upon it here, particularly as some of their remarks have already been quoted (Dyar and Knab, Jour. N. Y. Ent. Soc., Vol. XIV, 1906, p. 172-173). At the best the groups according to scale characters are unnatural and not in accordance with structures of primary importance. The truth is that very few tangible characters are available for generic subdivision in the Culicidae, and the bulk of the species must remain in a few large genera, regardless of the details of ornamentation. The well-marked divisions which are indicated by the larval characters and the male genitalia, and which coincide for both, are certainly fundamental. I will give only a few examples to illustrate how the application of Theobald's system of classification works out in practice.

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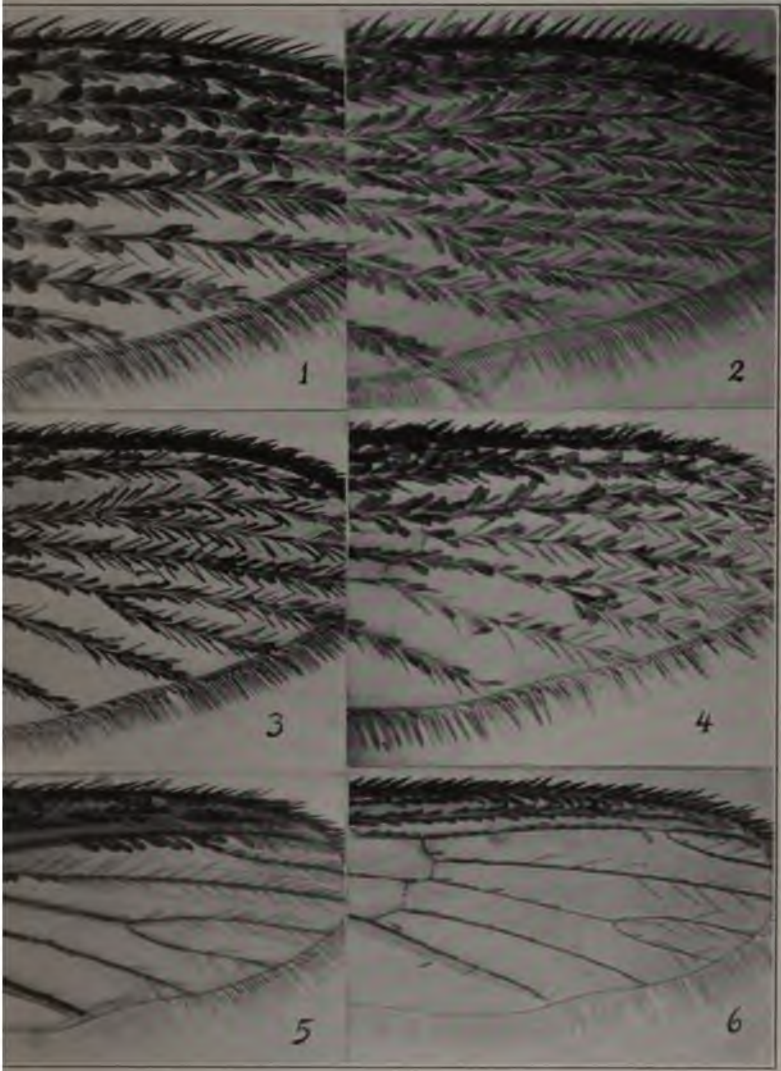
* Theobald's classification has been condemned in the following writings which may have escaped English readers: Neveu-Lemaire, Classification de la famille des Culicidae, Mem. Soc. Zool. de France, Vol. XV (1902), p. 195-227; Donitz, Beiträge zur Kenntniss der Anophelen. Zeitschr. f. Hyg. u. Infectionskrankh., Vol. XLI (1902), p. 15-88.

The genus *Verrallina* was erected by Theobald in 1903 (Monogr. Culic., Vol. III, p. 295) for "*Aedes*" *butleri* and *niger* from the East Indies, and associated with them—apparently from want of a better place—*Aedes nigricarpus* from the Amazons. In 1905 it would seem Theobald was no longer able to recognize his genus and the same three species, in Genera Insectorum, fasc. 26, p. 35, follow *Aedes* under the heading "genus uncertain"—no mention of *Verrallina*. In 1906 *Verrallina* reappears in Coquillett's classification (U. S. Dept. Agric., Bureau Ent., Tech. Ser. No. 11, p. 17), and is applied to two new forms from tropical America; the *Aedes nigricarpus* is assigned, again with a doubt, to the new genus *Isostomyia*.

In the Canadian Entomologist, Vol. xxxvii, 1905, p. 231, Miss Ludlow describes *Taeniorhynchus sierrensis*, and in a later paper (l. c., Vol. xxxviii, 1906, p. 132) she acknowledges that her species is synonymous with *Culex varipalpus* Coquillett. However, a further study of its scale-characters convinced her that the species cannot be correctly placed in *Taeniorhynchus*, or in any of the numerous genera already recorded from North America and, without locating it generically, she associates it with *Finlaya*. Mr. Coquillett has recently placed the species in *Ochlerotatus*, which position agrees very well with the views arrived at by Dr. Dyar and the writer.

Again, what a carry-all the genus *Stegomyia* has been for species of all kinds that happen to have a similar thoracic ornamentation. It would lead altogether too far to point out the kaleidoscopic changes that this genus has undergone

Perhaps the most striking example of the composite nature of the Theobaldian genera is furnished by his genus *Mansonia*.



CULICIDAE ACCORDING TO SCALE VESTITURE (KNAB).

1. *Mansonia fascipes* Coq.
2. " *signifer* Coq.
3. *Feltidia jamaicensis* Theob.
4. *Aedes squamiger* Coq.
5. *Uranotaenia sapphirina* O. S.
6. " *lowii* Theob.

This genus would seem to be an unusually well-marked one "whose chief distinctive character is the presence of large scales on the veins of the wings" (Monogr., Vol. ii, p. 173), yet it is of most heterogeneous makeup. Theobald in his first characterization of the genus (as *Panoplites*, l. c.) states that "the abdomen of the female is usually blunt," thus implying that his genus includes species in which the female abdomen is tapering. This difference is a fundamental one and certainly indicates different genera. Neveu-Lemaire (Bull. Soc. Zool. de France, xxxvii, p. 173), figures the receptacula seminis of *Mansonia uniformis* of India, and shows that there are two of these pouches in this species. Preparations of our American *Mansonia titillans* and *M. signifer* show three of these receptacula. Moreover, none of the many preparations of American mosquitoes of nearly all genera which I have had opportunity to examine show the same number indicated by Neveu-Lemaire for *M. uniformis*. With the exception only of *Anopheles*, *Megarhinus* and *Uranotaenia*, which have a single receptaculum seminis, all our American mosquitoes show three receptacula seminis.

Neveu-Lemaire states that the eggs of *Mansonia* are prolonged into a neck at one end, evidently drawing his data from an Old-World species. Of our American Mansoniads we know the eggs of *M. signifer* only, and these are covered by a film which projects in the form of a curious surrounding rim, unlike any other known mosquito eggs. We know nothing of the structure of the larvæ and male genitalia of the Old-World forms of *Mansonia*, but from the above data it is sufficiently obvious that the New-World species are not congeneric with them.

The accompanying figures of the wings of *Mansonia fascipes* Coq. and *M. signifer* Coq. offer a striking illustration of how misleading the wing-vestiture is which has been made the basis of the characterization of *Mansonia*. In spite of the great difference in the appearance of the wing-vestiture, the two species are very closely related, and by the structure, not only of the adults, but also of the larvae and the male genitalia, are congeneric. The larvæ of the two species are practically identical, even to the peculiar dark red color of their bodies. By the study of the superficial characters the relationship of *Culex signifer* with *Mansonia* was never suspected. The species was first described under *Culex*, then placed in *Stegomyia*, and then made the type of the genus *Pneumaculex*.

The genus *Grabhamia* was erected by Theobald for certain mosquitoes in which the wings bear light and dark colored scales of a certain type intermixed. Illustrations are here given of two species, *Feltidia jamaicensis* and *Aedes squamiger*, which, according to the wing-scales, are typical representatives of Theobald's genus *Grabhamia*. While these species are now both referred to *Aedes* they belong to separate well-marked groups, which, in a previous paper, Dr. Dyar and the writer have characterized as *Janthinosoma* and *Aedes*. These two groups are exceedingly well defined in the larval stage and in the male genitalia. However, as no good characters could be found for separating the females, they have been united, and, at the best, can only be recognized as groups of subgeneric rank; *Feltidia* again separating from *Janthinosoma* proper by the simple claws of the female. *Aedes squamiger* has been described by Miss Ludlow under the name of *Grabhamia deniedmannii*. Recently Mr. Coquillett has erected the genus *Lepidoplatys* for this species which has toothed claws in the female. The genus *Grabhamia* as defined by Mr. Coquillett is identical with the group *Feltidia* as above characterized.

The last two figures of the plate are added to show the inconsistency of the Theobaldian classification. According to scale characters these two species should be placed in separate genera, yet the relationship is so obvious by other characters that not even the boldest disciple of the scale-classification has presumed to separate them. The test of the value of such characters would lie in their consistent and undeviating application and such a test the system evidently will not stand.

I am under obligation to Mr. H. S. Barber of the National Museum for the photomicrographs from which the figures were made. The figures all represent the same portion of the wing so that a proper comparison can be made.

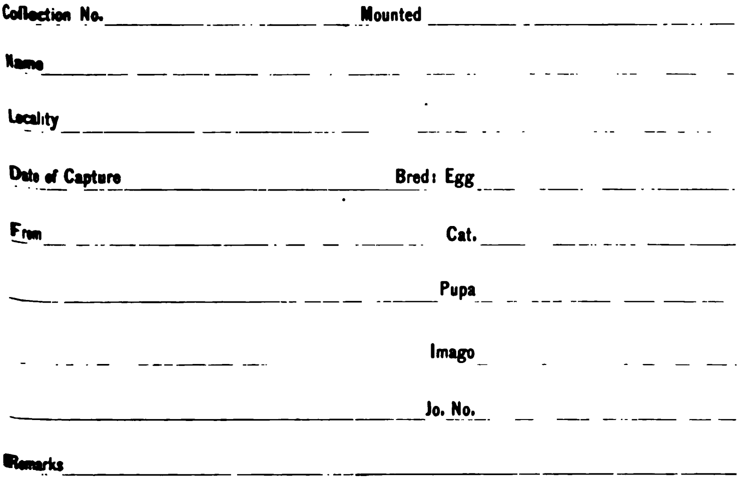
Cards for Data.

BY SIDNEY C. CARPENTER.

I was much interested in your editorial on pp. 25 and 26 of the January NEWS in regard to modern aids in the work of entomologists. I enclose a sample of three cards that I am using, which may be of interest to some of your readers. In all three forms the name of the species is entered on the red line at the top.

Of course the requirements of no two collectors would be just alike, but special cards will be printed very cheaply by any manufacturer of card index supplies, and the first cost of a cabinet, which need not contain more than one or two drawers to start with, will be more than offset by the time and labor saved in keeping and referring to records.

I use Form 1 for each specimen in the mounted collection. The space at the right is for the date of the different stages, if the specimen has been bred. "Jo. No." is the Journal Number which I give to each set of eggs, caterpillars, etc., to enable me to keep track of their records.



Collection No. ____ Mounted ____

Name ____

Locality ____

Date of Capture ____ Bred: Egg ____

From ____ Cat. ____

____ Pupa ____

Imago ____

____ Jo. No. ____

Remarks ____

Form 2 gives a graphic record of the life history. I have filled the card in with the record for *Vanessa antiopa*, and it is self explanatory. The horizontal spaces are double, to vide for overlapping broods.

Name

Stage	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.
Egg											
Caterpillar											
Pupa											
Imago											

Food Plants

Remarks

Form 3 is used as a general list of species, and serve sort of "handy reference" in case I want data on any par lar species. If it is represented in the collection I can tell glance, as the collection numbers are filled in the upper hand corners.

Family Coll. Nos.

Name

Locality

Food Plants

Literature

De Luxe Editions of Entomological Works.

By C. F. Baker.

Estacion Agronomica, Santiago de las Vegas, Cuba.

In late years I have been exerting myself to the utmost to interest American entomologists in the matter of possible better methods in entomological publishing. I have corresponded and talked with many concerning it, and they have all agreed heartily enough with me, though the point of *action* has not yet been reached. American entomological publications are primarily for American entomologists, are supported by them quite largely, the subject matter is contributed by them, and they can prescribe, if they will, the form that those publications are to take. That the present condition is an almost intolerable one in certain respects, I have partly brought out in an article in ENTOMOLOGICAL NEWS entitled "Entomological Literature, the *bete noire* of the Entomologist." *

There are also other very striking features in connection with the matter which I shall bring out from time to time. One of the most remarkable, and one that should certainly set American Entomologists to thinking, is the present tendency towards the publishing of costly *de luxe* editions of works on groups in which there is absolutely no good reason for a *de luxe* setting, as there might be among some Lepidoptera, and in which this form frequently seriously interferes with the very purpose for which the work is intended.

As a concrete example of this allow me to cite Ashmead's synopsis of the Chalcids, recently published by the Carnegie Museum, an institution supposed to be primarily founded in part for the promotion of entomology in the interests of American entomologists. It was a great thing theoretically for this museum to have published such a work. Did it turn out, however, to the practical benefit of the mass of American entomologists? Let us examine it and see. It measures ten by thirteen and one-fourth inches and is one and one-fourth inches thick, and weighs *four pounds and six ounces*. It has three hundred and thirty pages, with about thirty-three lines to the page, the full printed pages carrying about four hundred and thirty words and having *a blank margin of two and one-half inches.* Some of the pages must have been joy to the compositor, since they are rich in printer's "fat." There are nine plates of *merely outline drawings* which would have been far more useful inserted in the text, and could just as well have been so inserted and thus saved cost and weight. For this work we pay $6.00.

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* ENT. NEWS, Vol. xvi, pp. 264-270, Oct., 1905.

As nearly as I can estimate, if this book be translated into terms of a good, clean, well printed journal of normal size, like ENTOMOLOGICAL NEWS, it will occupy about three hundred and twenty pages. I take down the first volume of ENTOMOLOGICAL NEWS within reach (for 1894) and find that it measures six by nine and one-half by one inch, weighs fifteen ounces, and contains three hundred and fifty-two pages. It contains also twenty plates, of which one is finely colored,—a larger work than that on the Chalcids so far as *actual matter* goes and yet only about *one-third the size and one-fifth the weight;* it costs one dollar,—*one-sixth of the price!* It may be argued that the size and weight and price of the volume are of no moment to the great laboratories and libraries. But are not American entomological works published primarily for the *mass* of American entomologists,—men of small means,—men who must frequently move from place to place during their earlier years, men who must crowd much into busy lives of teaching and economic investigation or professional work, and who need "manuals" that are workable table manuals in more respects than in the mere name? Are such works to be intended as mere monuments by their size and worse than useless elegance to the institutions issuing them? A book of the size and weight and unwieldiness of this one on the Chalcids is a veritable "bull in the china shop" on the entomologist's work table! I maintain that the questions of actual utility, real usability, and availability to the greatest possible number of workers are points that must be considered in American entomological publishing; and I believe that such ideas were part and parcel of the original motives underlying the foundation of the Carnegie Museum, the Smithsonian Institution, the Field Columbian Museum, and other institutions of the sort. Surely the recommendations of such important organizations as the various entomological societies of America will be heeded in the matter.

We need lists, synopses, and manuals that are thoroughly and really "manuable"—to adapt a meaningful Spanish word. Why can we not have scientific works gotten up on as good a plan as Oxford Bibles,—on thin, strong paper, with flexible covers, and with copious marginal notes and references. I would feel contented to pay even six dollars to get the synopsis of the Chalcids in the thoroughly usable and condensed form in which it might easily have been issued. But to be compelled to burden myself with this elephantine monstrosity, that is as different from what it should be to serve the very purpose for which it was intended as a solid-wheeled ox-cart is from a racing sulky, is enough to make one doubt the fitness of some things born of modern scientific activities. And over and above all other considerations, it fills one with regret to think how much more of important and needful work could have been put out within the same cost and space of this one unwieldy tome.

Considered from almost any point of view, what could be the benefits to any one in the absurd inflation of a book containing about the material of Cresson's Synopsis, and intended for a working manual, to the size of the bulky and costly tome under discussion. And we are unfortunately compelled to ask the same question about Wytsman's "Genera Insectorum" and a number of other otherwise extremely important general works being issued to-day. The ridiculous form in which such works are being issued compels small and costly editions of very limited circulation, whereas such works should surely be in the hands of every working student in the country.

It often seems as if public institutions of to-day considered it a most noteworthy event to issue a work as nearly as possible in the form of the ponderous and impossible folios of the seventeenth century. I will agree that such events are always as *noteworthy* as possible, but they are not praiseworthy! Is there not some publishing house or public institution that will break away from musty and antiquated traditions and give us entomological manuals—of which in days to come *the number will be legion*—in a practical, thoroughly usable form, really conforming to the needs of twentieth century workers?

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., APRIL, 1907.

SPRING sits in the lap of winter and at the present writing we have had but few indications of gentle spring. However, we have heard rumors of what some of us are going to do as soon as insects become active. One careful collector has his itinerary made out, and his dates are fixed by certain interesting captures that he has previously made. He will visit these places again and will doubtless be rewarded by rarities. The early insects are on the wing, and in the Lepidoptera now is the time to study the individuals from wintering chrysalids. What should we do at the commencement of the collecting season? Here are some of the good things to do: collect a lot of perfect specimens of each species as they appear; study individual variation; patronize the dealer in pin labels; study the life-history of some species. There are plenty of them about which we know little or nothing. Send your observations to the NEWS. Do not collect with a view of seeing how many named species you can get, but study your material and make the result known. Soon insect music will resound over the land, and as this is the age of insects entomologists should be up and doing.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

CORRESPONDENTS will kindly note that the address of Mr. John A. Grossbeck is Agricultural Experiment Station, New Brunswick, N. J.

> I know that you know nothing.
> Others know not even this.—*Socrates* (revised).

W. T. CLARK, until recently connected with the Entomological Department of the University of California, is now Professor of Entomology in the Alabama Polytechnic Institute at Auburn.

ADDITIONAL NAMES of persons willing to identify certain insects (see ENT. NEWS, February, p. 59, March, p. 105):

Charles A. Hart, Nat. Hist. Building, Univ. Illinois, Urbana, Illinois, Orthoptera.

J. Douglas Hood, Nat. Hist. Building, Univ. Illinois, Urbana, Illinois, Thysanoptera.

Dr. J. W. Folsom, Urbana, Illinois, Collembola and Thysanura.

G. Chagnon, Box 186, Montreal, Canada, exotic Buprestidae.

PHALANGID NOTES.—When in 1904 (Jour. N. Y. Ent. Soc., XIII, p. 253) I described *Caddo glaucopis* as new, I was unaware that the description of *C. agilis* Banks had been taken from immature specimens, that fact being published by Mr. Banks in the same number (p. 256). Mr. Banks has recently been kind enough to examine an adult specimen of *C. glaucopis* collected by me last June at Sandford, Ontario, and reports that it is the same as the adult of his *C. agilis*. I regret having made the synonym and take this opportunity to rectify the blunder.

I wish also to record here the capture last July at Carlton Station, Orleans County, New York, of an adult male of *Phalangium longipalpis* Weed, which, as far as I am aware, has heretofore been known only from Arkansas.—CYRUS R. CROSBY, Ithaca, N. Y.

BUTTERFLIES IN BATTLE.—"A battle of butterflies," said the Japanese Viscount firmly.

"Impossible!" cried the lady on his right.

"Oh," the Viscount insisted, "the thing is authenticated. It happened on August 20, 1889. Tales and poems without number have been written on it.

"On the evening of August 20th two opposing armies of the butterflies fought an aerial battle between Nojima and Kavasaki-Mura. The fight continued till sunset, when the smaller army turned and retreated, the victors pursuing it till all were lost in the rosy sunset haze. The ground beneath the combat was thickly strewn with wounded and dead warriors.

"The battle drew a thousand people. It occurred about thirty feet up in the air. The spectators were amazed and horror-stricken to see these gentle blue butterflies grappling and struggling furiously and silently in a blue blizzard above their heads."—*Newspaper*.

Entomological Society of America.—The membership is already over two hundred and fifty, and these come from thirty-six States, from four Provinces of Canada, from the District of Columbia, from Cuba, and from Hawaii. The next meeting will be held about August 19th at Boston during the session of the International Congress of Zoology. The following meeting will be in Chicago during Convocation week in December.—J. Chester Bradley, *Secretary-Treasurer.*

Correspondents will kindly allow me to state that I am now completing a monograph of American Stoneflies (Perlidae), and have in prospect further work upon the world-fauna in this family, and that I am in need of more material from all quarters for study. Perlidæ are so fragile and so unattractive to collectors that musenm collections of them are exceedingly scanty. I should be greatly aided if my kind correspondents would send me such material as they have or can get easily in this group. Specimens in any stages, preserved in any way (alcoholic preservation is best for them)—even a very few of them—would be most acceptable to me. I will determine, or give named exchanges if desired, and I will gladly send my publications on the group to all who will aid me with material for study.—James G. Needham, Cornell Univ., Ithaca, N. Y.

An Enemy of the Rocky Mountain White Pine.—Some time ago a student of mine, Miss Hazel Schmoll, kindly procured for me some cones of the white pine, *Pinus flexilis*, from Ward, Colorado, 9000 feet. On opening one of these to demonstrate its structure to the class, it was found that practically every seed was hollow, and contained a living Scolytid beetle. The destruction of the seeds—so well protected by the structure of the cone from the attacks of squirrels, etc.—must be very great, and may account for the fact that *Pinus flexilis* is not so abundant as several of the other conifers. Dr. A. D. Hopkins, to whom I naturally referred the beetles, says that they belong to an undescribed species of *Conophthorus*.—T. D. A. Cockerell.

The following prescription is considered an unfailing specific for a disease among entomologists known as Hypertrophied Ego. It is not known to be contagious or epidemic, but it is certainly endemic. The remedy is as follows:

℞

	Corn meal	20 pounds.
	Sodium chloride	1 ounce
	Aquae fluvial .	8 quarts.
M	Burlap .	3 yards

S Heat the water to the temperature of the blood; stir in the corn meal and salt, pour the mixture on the burlap and envelope the entire head with the poultice. Allow it to remain on over night. By morning the Ego will be reduced to normal proportions. Repeat if necessary.

A NEW local Entomological Society has been started at Palo Alto. Miss Julia Wright and Mr. Fordyce Grinnell, Jr., are leading spirits in this movement. We wish the new club a hearty success and long life.

DR. S. W. WILLISTON has in press the new edition of his "Manual of North American Diptera," which will be illustrated with about a thousand figures of flies and will greatly simplify the study of the order for beginners.

A DETERMINED fight is being made by the students and other friends of the College of Agriculture of the University of California to secure from the Legislature an appropriation for a large building to house the college. If this is accomplished the Entomological Department will leave its present temporary quarters and find accommodations in the new building.

Doings of Societies.

California, despite the seeming setback of April last, still continues to do her part in furthering the Science of Entomology, and, indeed, the Golden State offers splendid opportunities for active study, and there are many here who are doing good work.

Broadly speaking, the desire to form a club for any study indicates an earnest desire on the part of those interested for sincere co-operation and progress. The readers of the ENTOMOLOGICAL NEWS will doubtless be very glad to know that it is with this spirit that an interesting Entomological Club has been organized in Palo Alto, California, known as "The Santa Clara Valley Entomological Club," which covers the territory of the Santa Clara Valley.

The initial meeting was held December 5, 1906, at the home of Miss J. D. E. Wright. Fifteen entomologists assembled to discuss the formation of the society, and a committee on organization was appointed.

At the next meeting, held January 19, 1907, Mr. C. F. Palmer in the chair, the constitution and by-laws were adopted and the following officers elected for the ensuing year: President, Mr. R. W. Doane, Stanford University; Vice-President, Mr. Earl Morris, County Entomologist, San José; Secretary-Treasurer, Miss Julia D. E. Wright, Palo Alto.

Mr. Earl Morris gave an interesting talk on the duties of the

County Entomologist, which prove to be numerous and varied.

The President then outlined a plan of work to study the salt marsh fauna, which is interesting and peculiar in this district.

On February 8, 1907, a most successful meeting took place, at which twenty-five persons were present; Mr. R. W. Doane, presiding.

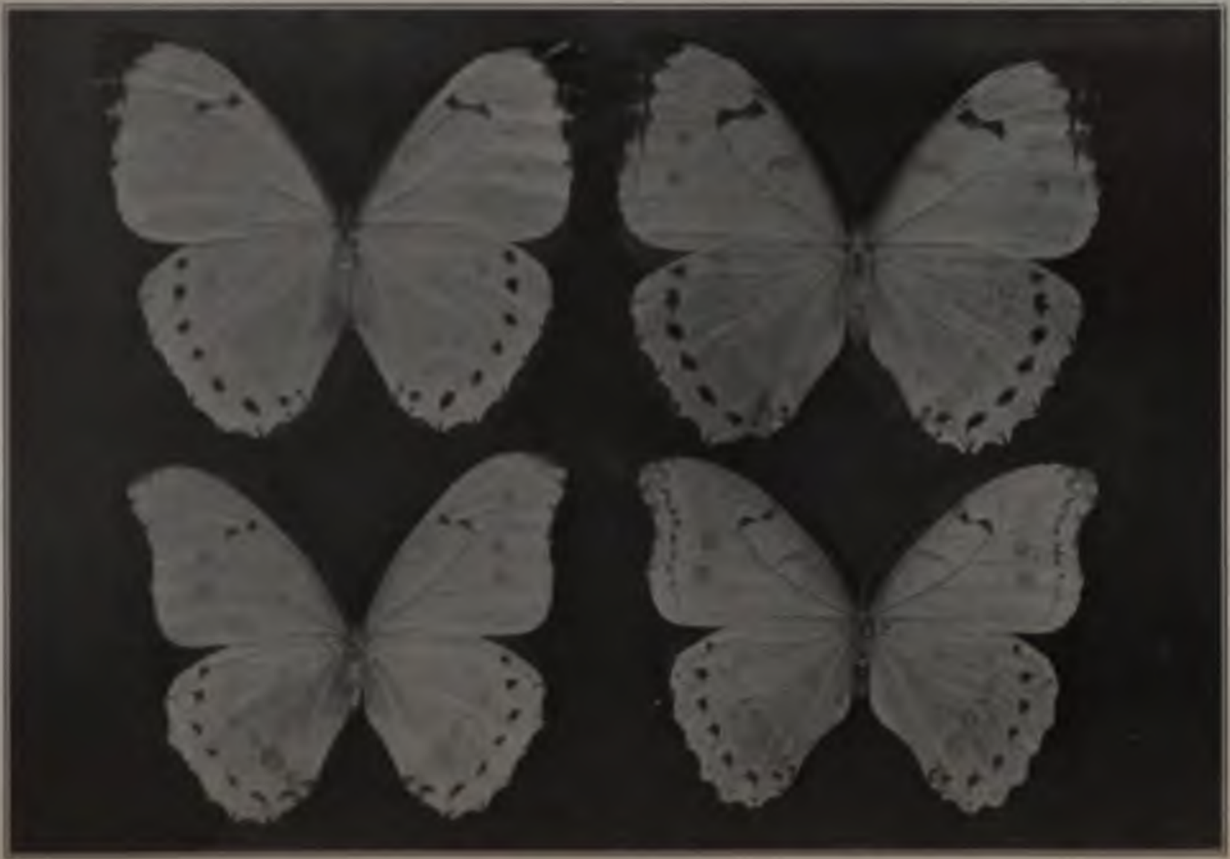
Miss Isabel McCracken, of Stanford University, told of her work on a sport of *Lina lapponica*, with notes of its heredity value, illustrated with formulæ of the breeding experiments. A box of specimens and also colored plates of the beetles were exhibited. Discussion followed, by Professor Kellogg, Mr. Doane, Mr. Fullaway, Mr. Derby, Mr. Grinnell.

Mr. F. X. Williams, who has recently returned with the expedition of the California Academy of Sciences, to the Galapagos Islands, then gave some of his experiences of the trip and collecting. The expedition as a whole seems to have been quite successful, but the insects were not very abundant, and as regards beetles, very few species were found, while only four species of butterflies were taken, all of which are distributed generally in the southern parts of this country. The meeting then adjourned.

The Santa Clara Valley Entomological Club holds its regular meeting once a month, and as soon as the weather permits, field days will be in order and the club will begin its collecting in earnest.

The following is a list of the charter members: Professor Vernon L. Kellogg, Mr. R. W. Doane, Mr. J. Chester Bradley, Secretary Entomological Society of America; Mr. C. F. Palmer, Mr. Earl Morris, Santa Clara County Entomologist; Mr. E. G. Dudley, Mr. H. V. Greenwood, Mr. W. M. Davidson, Mr. F. Grinnell, Mr. C. R. Coolidge, Mr. F. W. Rust, Mr. F. X. Williams, Mr. W. L. Scofield, Mr. E. J. Newcomer, Mr. D. L. Fullaway, Mr. A. W. Derby, Mr. J. G. Grundel, Mr. C. von Geldern, Miss Isabel McCracken, Miss Rose Patterson, Miss Alice M. Patterson, Miss Helen A. Lewis, Miss Elizabeth Scofield, Miss Julia D. E. Wright, Miss Edith Patterson.

JULIA D. E. WRIGHT, *Secretary*.



MORPHO THOOSA Smith ♂ and ♀. Lower figures MORPHO POLYPHEMUS

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Morpho thoosa Smyth.

By ELLISON A. SMYTH, JR., Blacksburg, Va.

(Plate VIII.)

In March, 1903, I described and figured in the ENTOMOLOGICAL NEWS, Vol. XIV, No. 3, page 85, under the name of *Morpho thoosa*, a new variety or form of *Morpho polyphemus* Dby.-Hew. The male only was described from material taken at San Juan Evangelista, State of Vera Cruz, Mexico, and sent me by Mr. E. K. Harvey, of Los Angeles, California.

Since then Mr. Harvey has sent me additional specimens, including a female. I have carefully compared this female with twenty-one females of *polyphemus* and var. *luna*, and find it shows the same character of differences from these, that males of *M. thoosa* bore to one hundred and five males of *M. polyphemus*. I judge that *M. thoosa* will constantly average larger than *M. polyphemus*: males of *thoosa* are 5 3/16 inches in extent; of *polyphemus*, 4¾: one ♀ of *polyphemus* is 5½ inches, and one of *luna* 5⅝; the remainder of the twenty-one ♀ ♀ do not exceed 5 1/16: the one ♀ of *thoosa* is 5¼; as this is only 1/16 inch larger than the ♂, presumably it is under the maximum.

The distal borders of the wings, upper surface, in *thoosa* ♀ are not buff as in var. *luna;* the whole under surface is more buff and has more prominent markings than ♀ ♀ of *polyphemus*, but less than *luna*. The ocelli are more pronounced than in *M. thoosa* ♂, but much less so, and less numerous than in *luna* or *polyphemus*. Apex of forewings heavily marked with black as in ♂ ♂, and general color of a greener pearly-lustre than in the two other forms. To describe further were to repeat my former description of the ♂. The accompanying illustration best contrasts the two sexes of *M. thoosa* with those of *M. polyphemus;* the upper pair are *M. thoosa;* the lower, *M. polyphemus* as typical as I could select from 126 specimens. The figures are reduced one-half.

As far as I can learn, *M. thoosa* belongs to the eastern coast, and *M. polyphemus* and *luna* to the central and western portion of Mexico.

A new Species of Phoebolampta (Tettigonidae, Orthoptera) from Cuba.

By JAMES A. G. REHN.

Phoebolampta cubensis n. sp.

Type:—♀; Havana, Cuba. (C. F. Baker.) [A. N. S Phila.]

Closely allied to *P. magnifica* Brunner* from Haiti, but very considerably smaller and with the costal margin of the tegmen much more sinuate in the distal half, and apparently with a greater number of spines on the distal section of the ventral margins of the caudal femur.

Size medium; form distinctly compressed Head gently sloping to the produced, subequal fastigium, which is very slightly elevated, with a very fine slight median sulcus and a subtruncate apex, facial fastigium touching the fastigium of the vertex, eyes moderately large, subspherical, quite prominent when viewed dorsad, antennæ filiform, in length distinctly exceeding the body and about equal to two-thirds the length of the tegmina Pronotum with the dorsum flattened and regularly expanding caudad, the cephalic width about one third the caudal, cephalic margin truncate, caudal margin arcuate with the faintest possible indication of angulation, lateral angles rectangulate but not sharp, disk punctate, much more thickly so caudad than cephalad, a distinct V-shaped impressed figure on the cephalic portion; lateral lobes about half again as deep as long, the cephalic margin nearly straight, caudal margin flattened arcuate, ventral margin slightly sinuate with the ventro-cephalic angle distinct, humeral sulcus distinct, but not large or deep. Tegmina glabrous, the greatest width contained slightly more than three times in the length; costal margin regularly arcuate in the proximal three-fourths, distad of this following the general trend of the principal veins for a short distance then rounding to the apex, sutural margin gently bisinuate, one curve at the apex of the dorsal field, the other immediately proximad of the apex to which it rounds obliquely, the immediate apex rounded, width of the tegmen at four-fifths the distance from the base two-thirds the greatest width, which is at about the proximal third; radial vein diverging shortly proximad of the middle, furcate, the rami reaching the sutural margin. Wing extending beyond the closed tegmina by less than the length of the head, apex rectangulate. Mesonotum and metasternum with triangular lobes. Ovipositor very short, thick, but little curved, slightly narrowed and the apex very bluntly rounded; subgenital plate produced, narrow, compressed, keeled, the apex shallowly emarginate. Cephalic femora with four minute spines on the cephalic margin, the caudal margin unarmed; cephalic tibiæ with the dorsal margins unarmed except for the apical spines; auricles rimate. Median femora half again as long as the cephalic, the cephalic margin armed with six or seven small spines, caudal margin unarmed. Caudal femora about half as long as the tegmina, moderately but not strongly inflated proximad, tapering to the distal section which is thick when compared with the proximal two-thirds, ventral margins with twelve to thirteen spines, ventral sulcus narrow proximad, genicular lobes bispinose; caudal tibiæ considerably longer than the femora, heavy, compressed, subtrigonal in section, dorsal margins regularly spined, spines twenty-five to twenty-six in number, ventral margins with the spines few proximad, more numerous distad.

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* Monogr. der Phaneropt., p. 352, tab. 7, fig. 103.

General color of the tegmina oil green, face pale apple green, dorsum of head very pale pinkish buff, dorsum of the pronotum pale malachite green, the lateral lobes and pleura olive-buff and the angles lined with ochraceous buff, eyes prouts brown; limbs wood brown becoming apple green distad.

MEASUREMENTS.

Length of body	26.5	mm.
Length of pronotum	6.8	"
Greatest caudal width of pronotum	6.	"
Length of tegmen	46.	"
Greatest width of tegmen	13.5	"
Length of wing beyond closed tegmina	2.3	"
Length of caudal femur	22.5	"
Length of caudal tibia	25.	"
Length of ovipositor	3.	"

The type is unique.

Economic Entomology.

By OWEN S. PAXSON, DEVON, PA.

Generally speaking, I am very much opposed to the pract
of economic entomology as a usual thing or by the pub
Such depredations as are caused by the Rocky Mountain loc
gypsy moth and San José scale are indeed serious, and, as th
insects affect large areas, it is necessary to exterminate
pests, at least for the welfare of the human race. If allo
to continue they would become unbearable, for their natu
enemies or foods are wholly or practically destroyed. T
magnitude of the calamity is alone the reason for my cha
of mind. These cases of such paramount importance should
fought by scientific people. In fact, I think that all poi
on entomology should be in their hands and under their ju
ment, and not in that of the populace, who know nothing ab
such matters, and, when once started on these raids, can
be stopped, except after years of trouble and expenditure.

No one living in North America two hundred years a
thought that the millions of birds then inhabiting the v
wilderness, could or would be destroyed in the way they ha
been. Why do not insects run such a chance, although
producing themselves much more easily and in vaster prop
tions? It may sound foolish, but I thoroughly believe it w
happen at a date not far distant; that is, if civilization w
persist in carrying out its present plans. This continual cle
ing and burning leaves few places for insects to transform
or undergo their metamorphoses. All land around our la
cities is persistently watched. The majority of private pla
are kept nearly as clean as a rug, for the leaves, rubbish a
trees are continually disturbed. Thus we kill almost all the l
and destroy the hibernating places around us. Even the a
joining fields, meadows and woodlands are watched on a sm
ler scale. They are frequently ploughed or burned over, th
destroying in a single day countless hordes, which serve
food for the wild life. Besides the destruction caused by m
the insects have all their natural enemies to contend with.

Year after year ground is reclaimed, so to speak, from natu and, when this happens, the great majority and probably all the life inhabiting this region is killed or driven away. How can anything contend with this condition? As the years pass, all these schemes will be multiplied in every way to an enormous extent.

Why advise a farmer or anybody to destroy insects just because a few of his plants are affected, and the trouble is only local? If anything is done, leave it to men of science. If the insects become general and a plague is threatened, it is only caused by some of man's ignorant notions in destroying the natural foods or enemies.

I have never approved of the general feeling that seems to control the actions of most men, of destroying nature no matter what the form or condition. Those who do so generally say they do it for sport, for under this mask we do things abominable to any decency. Thus the different branches of the several kingdoms have perished, and probably the insects will meet with a similar fate. Surely, these insects and lower animals are a joy to everybody. I cannot realize any person feeling differently. What would the earth be without them? Then let us all, and especially scientists, protect them in every way whenever possible, instead of following the old plan of killing everything we see and for no purpose. I think we live in a golden age; just think of the myriad of insects to delight the entomologist! They are so easily procured now, but we should look into the future and thus prevent this great catastrophe. Do not overstep our privileges and murder the innocents. History is full of such behavior, always with bad results in the end. The progress of the world, many will say, naturally clears the earth of its wild life, and, of course, this is so as long as we follow the present plan. But, I say, as long as we are civilized, why not act the part of civilization? Leave all, or the great majority, of animals to live the life we are enjoying. Surely, our existence will not be retarded by their presence, but benefited in more ways than we have the least idea of.

Of the virgin forests that covered practically all the east and west what a poor remnant remains to tell the sad tale.

Now their grandeur and magnificence are to be seen on
small unfrequented regions. Little did the woodchoppe
three centuries ago think of making such an impression o
solid wall that stretched for miles along the coast and i
for leagues. I doubt if anybody cared. What is the re
Why did not the learned of that day see the great da
Their thoughts were for its destruction, thus giving them
cash when other means failed, and at that time the f
were considered a great nuisance, so they were burned pr
cuously and continually. Money is one of the greatest c
the world has known, and is often the real and only caus
the disappearance of nature's beauties. Who has not n
the vanishing of our lovely wild flowers before the ad
of civilization? They will in many instances die away
gether, while the few that are more fortunate may be fou
the adjoining country. This year they are quite near h
but owing to the influence of man, will wholly disa
from their old haunts. The next season may see them a
a nearby highway. Their pure and wonderful beau
obliterated to make way for the rude and unwieldy wor
man.

The buffalo well illustrates the fate of the mammals
their countless numbers roamed over the broad prairi
the west, even far into Canada and Mexico. They we
thick as to blacken the earth for miles, but now only a
remain. The rest have fallen for money and "sport."
carefully and wisely did the Indians manage the killi
the few they sought, and then only for supplying thems
with food and shelter. It is almost incredible to think
we have behaved so barbarously. The birds likewise
fared badly, and are killed for their feathers. Already
beautiful, useful and wonderful species are practicall
entirely extinct. Before this slaughter ceases many more
have perished or be reduced to remnants by the wickedne
man.

The insects have not yet decreased noticeably, an
destined to succumb, will only disappear many years h
Did not the animals, trees, etc., appear to be inexhaustible

they roamed or ranged in multitudes across the new land? Only the thicker settling of the country can affect the Arthropods, but I think we are on the straight road to this result.

It is now too late, but we are beginning to understand the results of forest destruction. How greatly does it affect the climate! Or rather, the earth deprived of its covering becomes dried out, so that it is unable to withstand the natural droughts. So it appears to us that there is less rain. In other words. we think the weather has changed. I, for one, do not believe that it seriously changes the prescribed routine. The trees, however, are a great preservative of the earth's crust. Holding it much more firmly together they prevent terrible washouts at different seasons.

All creations were placed here for some good, not to be killed in a few years. The animal, vegetable and mineral kingdoms balance each other. When one portion or the other is destroyed in vast quantities the others are unbalanced, and thus the dependent ones also perish or change their food.

What right has man to be the judge? The results of his endeavors, as seen throughout the world, are mostly mean and unprincipled. Far better leave these things to nature, for she alone can make and solve her own problems.

Economic Notes on Aphids and Coccinellids.

By Roswell H. Johnson, Cold Spring Harbor, New York.

An experimental study of evolution in *Coccinellids,* such as I am engaged in, necessitates a thorough survey of the vicinity for aphids, in order that *Coccinellids* may be there collected and food furnished them. There naturally results a considerable amount of data not pertinent to my subject, but yet of value to economic entomology, which I wish to submit, even though it be fragmentary.

I have found aphids on the following plants in the vicinity of Cold Spring Harbor, Long Island, which I have not seen recorded from eastern North America:

Acalypha virginica L. (upon the roots).

Arctium minus Schk.

Aster multiflorus Ait.
Baccharis haelimiflora L.
Cakile edentula (Bigel.) Hook.
Cuscuta gronovii Willd. (indoors).
Cydonia japonica.
Deringa canadensis (L.) Kuntze.
Iva frutescens L.
Parsnip (on the flower stalks).
Potentilla litoralis Rydb. (indoors).
Rhamnus cathartica L.
Solidago sempervirens L.
Washingtonia longistylis (Torr.) Britton.

A second species has been found upon *Vicia faba* (indoors) and upon the cultivated chrysanthemum (indoors). A species occurs on *C. frutescens* (indoors) different from either of those on the cultivated chrysthanthemum. I realize that this list has merely the value of directing investigation by students of this family.

The variation in resistance to the attacks of aphids in the following plants has seemed to me noteworthy. Two variegated varieties of the myrtle—*Vinca minor*—are much attacked by *Aphis circumflexa*, when grown under glass, while the common non variegated variety is but slightly attacked on its tender shoots. One succulent-leaved variety of the Paris daisy *Chrysanthemum frutescens* which I raised from seed under glass, was not attacked by the aphid so abundant on the typical specimens of the daisy growing alongside. The coccid of the chestnut is seldom seen, except on strong, rapidly growing shoots sent out from stumps. In collecting an aphid from the apple, I have noticed that full grown trees are not badly infested here, whereas spindling shrubby ones, such as are found along the highways and in orchards neglected from the time of planting, are sometimes much infected. The extermination of such trees, I should think, would assist in the control of the pest

Several of the highly colored aphids can not be successfully fed to Coccinellids, such as *Aphis lutescens*, *Cladobius sp.*, and the red aphids of the golden glow, wild sunflower, iva, and cockle-burr. The light red aphids of the goldenrod are eaten, however. Although some of the woolly aphids are eaten by Coccinellids, they are apparently discriminated against, especially a woolly aphid on *Crataegus*. *Alemodes* is not eaten by them.

Discrimination is shown by the fact that I have found only the following Coccinellids on the plants indicated: chestnut—*Cycloneda sanguinca;* Carolina poplar—*Adalia bipunctata; Solidago canadensis, Coccinella 9-notata;* willow—*Adalia bipunctata* and *Harmonia picta.*

The fact that *Adalia bipunctata* only was found on *Rhamnus cathartica* and *Euonymus europaeus* may, however, be due to the season, the aphids on these plants being the earliest species to be abundant. The much shorter generations of *Adalia,* as compared with *Hippodamia* and *Coccinella,* must assist it in its attack on these early aphids.

I have noticed the great effectiveness of small yellow syrphid larvæ both outdoors and in our vivarium. At some seasons, only a great deal of hand picking makes possible the raising of aphids. The syrphid seems to be more effective than any other enemy of the aphids here, and it attacks nearly, if not all, species, but I have not seen it attack *Aleurodes*—the white fly. Small spiders also are important indoor enemies of aphids. At times a fungus seems to produce a heavy mortality in the aphid of the parsnip.

The larvæ and adults of *Megilla maculata* are common on maize, and I have also found pupæ on the corn silk and leaves of a corn patch, in which I could see no aphids, either on the corn or weeds. They are apparently able to live upon pollen and spores without aphids. This may have some connection with the agility of the larvæ, which exceeds that of the other local Coccinellids, except *Cycloneda sanguinea.*

The period during which a female may lay fertile eggs after isolation has, in the case at least of *H. convergus,* exceeded that given by Burgess, attaining three and one-half months in one instance. I have noticed that in some cases eggs laid by females, which died within a few days, failed to hatch, although the eggs previously laid had been hatched. The last few batches of eggs laid by a female before death have failed to hatch in several cases, even when a male was kept with the female. I am inclined to conclude, therefore, that failure of eggs to hatch is not necessarily due to sterility, as generally assumed, but may result in some cases from an unfavorable condition of the female. This possibility must therefore be borne in mind in experimental breeding.

* * *

Coleopterological Notes, Synonymical and Descriptive.

By H. C. Fall.

Several years ago (1901) a supposed new species of *Mycetina* was described by the writer (Trans. Am. Ent. Soc., XXVII, p. 304) under the name *endomychoides*. From a reading of Horn's description the form in hand seemed to be distinct from *limbata*, but subsequent comparison with the type convinces me that the two are identical. *Endomychoides*, therefore, falls into synonymy.

A little later, on comparing some specimens collected by Professor Wickham, at Coeur d'Alene, Idaho, and sent me as *M. hornii*, with California examples of *hornii*, the two were found to be quite distinct. There can be no doubt that the Californian specimens are the true *hornii*, the differential characters separating this from the Idaho form and the Eastern *perpulchra* are shown in the following table:

Prothorax wider just before the middle than near the base, the sides distinctly sinuate posteriorly: humeral pale spot subbasal, not involving the umbone; dilation of posterior tibiæ of male beginning at or a little below the middle. . . . . ***perpulchra*** Newm.

Prothorax with sides parallel or slightly divergent posteriorly, not evidently sinuate before the basal angles: humeral pale spot involving the umbones.

Form less stout, elytra more finely punctate, size a little smaller; posterior tibiæ of male not dilated, but arcuately bent apically. ***hornii*** Crotch

Form stouter, elytra more coarsely punctate, size larger; posterior tibiæ of male dilated at apical third . . . ***idahoensis*** n. sp

These three species form a compact group, which must be separated subgenerically, if not generically, from both *limbata* and *testacea*. The above differences are quite sufficient for mutual separation, but there are a number of others that might be given, such as the relative depths of the transverse basal impression of the pronotum, the form of the scutellum, the prosternal impressed lines, etc. *Perpulchra* is widely distributed in the Eastern U. S.; *hornii* is known to me from both the Sierras and Coast Range of Middle California; Crotch also gives Oregon.

Alaephus nitidipennis.

This species, described by the writer in *The Canadian Entomologist,* August, 1905, p. 275, is unquestionably the same as *macilentus* Csy. The overlooking of Major Casey's description was due to the accidental omission of his species from the Henshaw List.

The following species recently received is certainly new:

Alaephus puberulus n. sp.

Rufotestaceous, elytra slightly paler; head and prothorax densely subrugosely punctate and somewhat dull; elytra more sparsely and finely punctate, shining; upper surface clothed with rather sparse but quite conspicuous short erect, pale hair. Antennæ slender, half the length of the body, second joint a little longer than wide, fourth shorter than the third and barely three times as long as wide; tenth nearly parallel, eleventh a little shorter than the tenth. Eyes much more prominent than the sides of the front, separated above by a distance subequal to the length of the fourth antennal joint, beneath by a distance one-third greater than the length of the second joint. Prothorax one-fourth wider than long, apex nearly as wide as base, sides broadly, evenly rounded, feebly sinuate before the hind angles, which are sharp and but slightly obtuse; disk evenly convex, broadly, feebly impressed near the middle of the side margins. Elytra four times as long and nearly twice as wide as the prothorax, humeri moderately prominent, sides nearly parallel and slightly arcuate to beyond the middle, punctures separated by rather more than their own diameters. Prothorax beneath closely punctate, metasternum and abdomen finely sparsely so. Basal joint of hind tarsus evidently shorter than the three following united, second and third joints slender, twice as long as wide or more. Length 6 mm.; width 2 mm.

Stockton, Utah.

Described from a single ♂ collected by Mr. Spalding and sent me by Mr. Knaus. Most nearly related to *gracilis*, but differing in the less elongate form, the erect pubescence of the upper surface, less approximate eyes and some other details.

Substituting *macilentus* Csy. for *nitidipennis* Fall, and including the present species, the table given by the writer in *The Canadian Entomologist*, XXXVII, p. 276, becomes as follows:

Table of **ALAEPHEUS**.

Eyes small, very slightly more prominent than the sides of the front, separated beneath by a distance which is about three times the length of the second antennal joint; fourth joint of antennæ barely twice as long as wide . . . . **pallidus.**

Eyes larger, much more prominent than the sides of the front; fourth joint of antennæ from nearly three to four times as long as wide.

  Body subglabrous, the pubescence recumbent and very sparse, fine and inconspicuous.

    Eyes separated beneath by a distance which is nearly twice the length of the second antennal joint; tenth joint of antennæ obconical, eleventh not shorter; elytra not much wider at base than the prothorax, strongly shining . . . . **macilentus.**

    Eyes separated beneath by a distance which is scarcely as great as the length of the second antennal joint; tenth joint parallel, eleventh shorter than the tenth; elytra much wider than the prothorax at base, moderately shining . . . . . **gracilis.**

  Body sparsely but quite conspicuously clothed with short erect hairs.

    Eyes separated beneath by a distance which is about one third greater than the length of the second antennal joint, tenth joint parallel, eleventh shorter; elytra much wider than the prothorax **puberulus.**

In addition to the above synonymy, the following may be announced at this time:

Microweisea (*Smilia*) *reversa* Fall   *atronitens* Csy.

Scymnus dentipes Fall   the ♂ of *haemorrhous* Lec.

Leptogenius virginicus Fall   *brevipennis* Csy.

Corymbites tigrinus is probably only a slight variety of *triundulatus* Rand.

Acmaeodera versuta Horn   the ♂ of *guttifera* Lec.

Agrilus illectus Fall   *jacobinus* Horn.

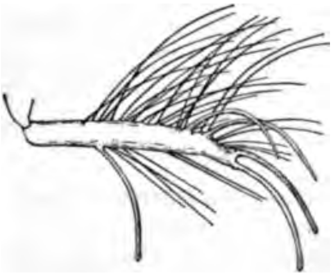
Jacobinus is out of place in Horn's table and in the following text, it being assigned to the section having the antennæ ser rate from the fourth joint, whereas the serration begins at the fifth joint. This error is, at least in part, responsible for the re-description of the species, since at the time of writing, comparison was made with those species only having the same antennal structure.

Aphodius blaisdelli Fall = *sparsus* Lec.

Both Dr. Blaisdell and myself were at fault in assigning this species to Horn's Group G, in which the middle and hind tibiæ are fimbriate with equal spinules. Mistakes of this sort are very easily made in this genus, especially with specimens in which the spinules have become nearly equal through wear. In the present instance I must confess that I gave this matter no attention, accepting without question the doctor's group disposition of the species. There are two specimens standing as *sparsus* in the Le Conte cabinet, the second one, however, is not like the one bearing the label and has probably since been placed there conditionally; it is probably a member of Group G, but I did not take time to verify this supposition. This species, which was taken in numbers by Dr. Blaisdell, near San Francisco, in a wood-rat's nest, has lately been taken sparingly by both Dr. Fenyes and myself at Pasadena in similar situations.

Oxoplus marginatus Lec.=the ♂ of *cruentus* Lec.

This synonymy is announced in the Le Conte bibliography, by Henshaw, but appears to have been rejected later. Mr. Henshaw tells me that he does not know by whom it was proposed, or on whose authority it was annulled; I have no doubt, however, of its correctness.



Clasper of *F. vexator* Coq., described in this journal, Vol. xviii, p. 102.

The Bees of Nebraska.—II.

By Myron H. Swenk and T. D. A. Cockerell.

FAMILY PANURGIDÆ (Concluded)

Genus **SPINOLIELLA** Ashmead.

1. **Spinoliella australior** Cockerell.

Glen, Crawford and Warbonnet Canon, Sioux County, Nebraska, July 28 to August 17, common at flowers of *Cleome serrulata* and occasionally on *Solidago* also. One would expect to find *S. scitula* Cresson here also, but all the specimens as yet captured are distinctly *australior*; the differences between the two species, though not great, are very constant.

2. **Spinoliella helianthi** n. sp.

♀.—Length 6 mm.; clypeus (except for two large, separated, basal, black spots), labrum, mandibles, supraclypeal area, dog's ear marks, and lateral face marks including whole of sides of face up to level of antennæ and a little beyond along the orbits, bright yellow. Rest of head shining black, the front coarsely, distinctly punctured, the cheeks indistinctly so. Antennæ black, the flagellum pale brown except the basal joints above, which are blackish. Front with long, erect, dense, gray pubescence, cheeks with similar but shorter and thinner pubescence. Thorax black, dorsum punctured like the front, clothed with long, gray hair, denser and paler on the pleura. Tegulæ shining brown. Wings hyaline, nervures brown. Abdomen black, segment 1 with a complete, median, deep yellow band, 2 with widely interrupted lateral bands, 3 and 4 with broad complete bands, fifth segment largely yellow. Legs black, with all the tarsi and knees and the anterior tibiæ, except for a black spot above and below, yellow. Legs and tip of abdomen with long, erect, whitish hair.

Type: Warbonnet Canon, Sioux County, Nebraska, July 12, 1901, on *Helianthus* (M. Cary), ♀.

S. helianthi is not close to any described species. It runs in the table in Trans. Am. Ent. Soc., XXV, p. 195 to *S. zebrata*, which is a much larger and very different species. The deep yellow marks of abdomen and black spots on the clypeus will serve to characterize the species.

Genus **CALLIOPSIS** F. Smith.

1. **Calliopsis andreniformis** F. Smith.

Lincoln, Omaha, West Point, Weeping Water, Cedar Bluffs, and Carns, Nebraska, flying abundantly from May 31 to July

20. Although essentially a vernal species, there is a female specimen collected at West Point, September 19, 1903, on *Aster* by Mr. J. C. Crawford, which may indicate a feeble fall brood. During latter June and July it flies principally at *Petalostemon violaceus* and *P. candidus, Rosa pratincola, Symphoricarpos occidentalis, Asclepias* sp. and *Melilotus alba.*

2. **Calliopsis coloradensis** Cresson.

Lincoln, West Point, Gordon, and Harrison, Nebraska, flying from August 29 to October 1, principally at flowers of *Solidago.*

3. **Calliopsis verbenae nebraskensis** Crawford.

Lincoln, Neligh, and Glen, Nebraska, July 4 to August 7, at flowers of *Verbena.*

Genus **PANURGINUS** Nylander.

1. **Panurginus malvastri** n. sp,

♂.—Length 8 mm.; clypeus evenly convex, very sparsely and finely punctured, and, together with the inner edge of the mandibles, bright chrome yellow, the rest of the head shining black, finely and rather sparsely punctured, closely so on the vertex. Antennæ black, the flagellum obscurely brownish beneath. Dorsum of thorax shining, very finely and sparsely punctured, the basal area of metathorax nearly smooth. Tegulæ testaceous. Wings clear, the nervures brownish basally but becoming black toward apex of wing. Legs mostly yellow, the coxæ, trochanters and more or less of the bases of the femora black, the black covering most of the posterior face of the anterior and intermediate femora. Abdomen shining, finely and sparsely punctured, the first segment subimpunctate medially, the posterior margins of segments 1-5 deeply depressed, the depressed margins of 1-3 markedly testaceous. Front, cheeks, dorsulum and pleura, legs and tip of abdomen with long, erect, thin, white hair.

♀.—Length 9 mm.; similar to the ♂, but the clypeus and whole of mandibles black, the legs black with only the anterior knees and a stripe down the front of anterior femora yellow, the pubescence everywhere denser and tinged with ochreous, abdominal segments 1-4 depressed and only first two feebly testaceous.

Types:—Pair taken in copula, Warbonnet Canon, Sioux County, Nebraska, June 13, 1901, on *Malvastrum* (M. Cary).

Paratypes:—Type lot, 3 ♀ ; Jim Creek, Sioux County, June 22, 1901, on *Malvastrum,* 6 ♀.

This quite distinct species runs out in the tables to *P. clypeatus* Cresson = *P. cressoniellus* Ckll., but is easily distinguished by the color of the legs, and other characters.

2. **Panurginus innuptus** Cockerell.

Present over the entire state, but much more abundant westwardly. Warbonnet Canon, Jim Creek, Crawford, Bridgeport, Haigler, Springview, Carns, Niobrara, Long Pine, Neligh, Broken Bow, West Point, and Lincoln. Flies from June 16 to to August 28, visiting the flowers of *Brauneria angustifolia, Ratibida columnaris, Helianthus annuus and H. petiolaris, Grindelia squarrosa, Petalostemon violaceus, Medicago sativa* and various species of *Solidago*. We have numerous pairs taken in copula. The male often lacks the black dots on the clypeus and on the lateral face marks.

3. **Panurginus renimaculatus** Cockerell.

Lincoln and West Point, flying at the same time and upon the same flower as *P. ornatipes*, including also species of *Aster*. In a series of thirty-three specimens of this species from Lincoln, there are two males. The male, hitherto unknown, is distinguishable by its small size (5.5 mm.), black tubercles, black nervures and stigma, and strongly narrowed, deeply emarginate median process of labrum.

4. **Panurginus stigmalis** n. sp.

♂ Length 8 mm; clypeus, labrum, mandibles and lateral face marks extending nearly to bases of antennæ and ending obtusely, bright yellow, the remainder of the head black. Median process of labrum with its sides forming distinct ridges, converging toward the slightly emarginate tip. Clypeus uniformly closely punctured. Antennæ black with joints 3-11 bright brownish testaceous beneath. Mesonotum coarsely, closely punctured, pleura very coarsely punctured, metathorax finely and indistinctly punctured, its base with a row of short irregular striæ. Tubercles yellow. Tegulæ testaceous. Wings hyaline basally, but becoming darkened toward their apices, the nervures brownish fuscous, stigma very large and dark. Legs black, with all the tarsi and knees, anterior tibiæ except a spot behind, and both ends of intermediate and posterior tibiæ, yellow. Abdomen deep shining black, basal segment subimpunctate, the following ones sparsely but distinctly punctured basally and especially laterally, apical margins of segments 1-5 with depressed, smooth, glossy areas. Pubescence very short, scant, entirely white.

♀.—Length 8.5 mm.; like ♀ of *P. simulans* but nervures paler.

Types:—Glen, Sioux County, Nebraska, August 12, 1906, on *Helianthus* (H. S. Smith), ♂, ♀.

Paratypes:—Type lot, 1 ♀; Warbonnet Canon, August 16, 1906 (L. Bruner), 1 ♂.

This species belongs to the *labrosus—labrosiformis—solidaginis* group, but is too large for any except *labrosus,* which, however, has a yellow spot above the clypeus. It must be very close to *labrosus,* and possibly represents only a larger western subspecies of it. The female differs from that of *labrosus* in its larger size and black tubercles. We have had no opportunity of making actual comparisons of the two species.

5. **Panurginus expallidus** n. sp.

♂.—Length 7 mm.; clypeus, except for its extreme latero-apical prolongations which are black, labrum, broad lateral face marks running up almost to bases of antennæ and ending acutely, and a small, triangular supraclypeal spot, bright yellow, the rest of the head, including the mandibles, black. Clypeus and face uniformly coarsely and fairly closely punctured, much more coarsely and closely so on the vertex. Antennæ black, the scape coarsely punctured, joints 4-11 bright reddish brown beneath. Mesonotum coarsely and closely punctured except on the disk, and bearing three short impressed lines in front, mesopleura very coarsely punctured. Tubercles yellow. Metathorax with a row of short striæ at base, its posterior and lateral faces finely, indistinctly punctured. Tegulæ testaceous. Wings hyaline, the nervures pale brown, the stigma dark brown. Abdomen shining, first segment impunctate, following segments finely and closely punctured, apical margins of segments 1-5 depressed, smooth, tinged with testaceous. Legs black with all the tarsi and knees, ends of intermediate and posterior tibiæ and whole of anterior tibiæ, except a black median posterior area, yellow. Pubescence sparse, densest on mesonotum, pleura, legs, and sides and tip of abdomen, entirely white. Median process of labrum broad, its sides moderately converging and straight, its apex distinctly emarginate.

♀.—Unknown.

Type:—Lincoln, Nebraska, August 28, 1900, on *Helianthus* (L. Bruner) ♂.

This species is also a member of the *labrosus* group, but is too large for *labrosiformis* and *solidaginis,* and differs further in the yellow tubercles and entirely yellow hind tarsi; from *labrosus* it differs in its pale brown, instead of fuscous nervuration, its black mandibles and the three impressed lines on base of mesonotum. It is really very close to *P. stigmalis*, just described, but differs in its uniformly hyaline wings with their paler nervures and stigma, black mandibles, yellow supraclypeal spot, and differently shaped median process of labrum. The face markings resemble those of *P. rudbeckiae*, but it differs at once from that species in its broader face, brown flagellum, and pallid nervures.

6. **Panurginus simulans** n. sp.

♂.—Length 7.5 mm.; agrees with the description of *P. expallidus* to which it is very closely related, but differs as follows: Lateral face marks ending obtusely above; mandibles with a median yellow band; median process of labrum narrower and more distinctly emarginate; basal half of clypeus with a median impunctate line; front of scape bright yellow; striæ at base of metathorax extremely short, not over one-third as long as in *expallidus;* abdomen somewhat less densely punctured.

♀.—Length 8 mm.; like the ♂, except as follows: Head entirely black, much more coarsely punctured, the median impunctate line of clypeus poorly defined; antennal joints 5-10 obscurely brownish beneath, joint 3 slender, exceeding 4 plus 5; mesonotum much more finely and sparsely punctured, the disk polished and subimpunctate; mesopleura with scattered, coarse, shallow punctures; striæ at base of metathorax longer, irregular, and sometimes indistinct; entire abdomen polished and its segments subimpunctate, except basally and laterally where the punctures are small and sparse, segments 1-4 with broad depressed testaceous margins; legs black except yellow spots on four anterior knees, tubercles black; median process of labrum with its sides sinuate and its base crossed by numerous oblique striæ, its apex emarginate.

Types: Nebraska City, Nebraska, September 7, 1901, on *Helianthus annuus* (M. A. Carriker, Jr.), ♂; do., September 14, 1901, ♀.

Paratypes: Type locality, September 14, 1901, on *Helianthus* (M. A. Carriker, Jr.), 1 ♀; do. on *Grindelia squarrosa*, 1 ♂; Lincoln, Nebraska, 1 ♀; West Point, Nebraska, September 2, 1900, on *Helianthus* (J. C. Crawford), 4 ♀.

The relationships of this species are practically identical with those of *P. expallidus,* which it greatly resembles, but from which it differs as above, and the comparison there given will apply equally well, except as to the color of the mandibles.

7. **Panurginus ornatipes** (Cresson).

A critical comparison of ♂ and ♀ cotypes of *Panurginus nebrascensis* Crawford with speciments of *P ornatipes* Cresson, shows the two to be synonyms, the name *ornatipes* having priority. *Panurginus boylei* Ckll. is to be considered a subspecies of *P. ornatipes* characterized by its wholly dark scape, representing in the mountains of New Mexico the typical form, which ranges in the plains and foothills from Texas to Nebraska. We have *ornatipes* from Lincoln, West Point, Broken Bow, and Glen, August 14 to September 18, flying commonly at *Grindelia squarrosa* and various species of *Solidago,* including *rigida* and *missouriensis.* The species has been found nesting at the Lincoln salt flats.

8. **Panurginus horizontalis** n. sp.

♂.—Length 8.5 mm.; clypeus, labrum, mandibles, supraclypeal area and lateral face marks up to level of tip of supraclypeal area deep yellow, its upper level forming a straight horizontal line. Antennæ deep black, the front of the scape with a yellow line. Face coarsely punctured, and with a prominent median ridge between the bases of antennæ. Mesonotum shiny, coarsely and closely punctured, the base of metathorax with a row of short striæ, rest of metathorax dull, finely, closely punctured. Tubercles yellow. Tegulæ testaceous. Wings dusky, especially toward their apices, the nervures black, stigma dark brown. Legs black, with all the tarsi and knees, ends of all the tibiæ and the front face of anterior femora, deep yellow. Abdomen finely and sparsely punctured, the basal segment subimpunctate medially, the apical margins of segments 1-5 broadly depressed, the depressed portions smooth and impunctate. Sides of abdomen fringed with long pale hairs, crossing in a loose fringe at the bases of the depressions on 2-6. Thorax, head and legs with short scattered pale hair, tinged with ochreous on mesonotum and vertex.

♀.—Unknown.

Type:—Glen, Sioux County, Nebraska, August 21, 1906 (P. R. Jones), ♂.

This species is related to *P. ornatipes* (Cresson), but is much larger and differs in the face markings, and other details. It is allied to *P. compositarum* Rob., but differs in much greater size, yellow mark on scape and tubercles, more black on anterior femora, etc. It is very close to *P. piercei* Crawford, but has the front of scape yellow and the wings darker; possibly it may prove to be only a variety of *piercei*.

9. **Panurginus piercei** Crawford.

Lincoln, West Point, Gordon, and Glen, Nebraska, August 12 to September 12, flying at *Grindelia squarrosa*, *Helianthus annuus*, *Bidens chrysanthemoides* and *Solidago*. This species is quite variable in the male; frequently the dog's ear marks are partly or wholly black, and one specimen in our series of eleven has the tubercles black also.

The Nebraskan species of this genus may be separated by the following tables:

MALES.

Pale color of face confined to clypeus, which is evenly convex and very sparsely punctured; 8 mm. . . . . **malvastri** n. sp.
Pale color of face not confined to clypeus . . . . 1.
1. Supraclypeal area black, or with only a small yellow spot; wings hyaline . . . . 2.
Supraclypeal area yellow; wings dusky . . . . 6.
2. Labrum and mandibles black; 7.5 mm . . . . **innuptus** Ckll.
Labrum yellow . . . . 3.
3. Tubercles black; nervures blackish; smaller, only 5.5 mm long **rectimaculatus** Ckll
Tubercles yellow; nervures brownish; over 7 mm long . . 4
4 Median process of labrum more strongly narrowed toward the scarcely emarginate apex, its sides distinctly sinuate; stigma brownish-fuscous; 8 mm . . . . **stigmalis** n. sp.
Median process of labrum less strongly narrowed toward the distinctly emarginate apex, its sides straight; stigma pale brown. 7.5 mm 5
5. Clypeus uniformly punctured; scape wholly black; lateral face marks acute above; striæ at base of metathorax longer. **expallidus** n. sp.
Clypeus with a basal median impunctate line; scape yellow in front; lateral face marks obtuse above; striæ at base of metathorax shorter . **simulans** n. sp.
6 Clypeus uniformly punctured; upper limit of yellow on face curved. 6 mm . . . . . **ornatipes** (Cress.)
Clypeus with a median depressed impunctate line; upper limit of yellow on face straight; larger, 8-8.5 mm. . . . 7.
7. Scape yellow in front . . . . **horizontalis** n. sp.
Scape wholly black . . . . **piercei** Crawf

FEMALES.

Front and vertex very sparsely and weakly punctured, shiny; 9 mm. **malvastri** n. sp.
Front and vertex strongly punctured . . . . 1.
1. Hind tarsi ferruginous . . . . 2.
 Hind tarsi black . . . . 3.
2. Clypeus entirely black, no supraclypeal mark; 8 mm. . **innuptus** Ckll.
 Clypeus with a yellow mark combining with yellow supraclypeal spot; 8 mm. **renimaculatus** Ckll.
3. Wings smoky, nervures black; smaller, 7 mm . . . **ornatipes** (Cress.).
 Wings clear, nervures brownish; larger, 8 mm. or over . . . . . . 4.
4. Mesonotum finely punctured, sparsely so on disk; clypeus separatedly and less coarsely punctured; joint $3 = 4 + 5$ . . **piercei** Crawf.
 Mesonotum coarsely punctured; clypeus coarsely puncto-striate; joint 3 exceeding $4 + 5$ . . . . 5.
5. Nervures dark brown . . . . **stigmalis** n. sp.
 Nervures pale brownish-testaceous . . . . **simulans** n. sp.

(The females of *expallidus* and *horizontalis* are unknown—possibly they are not distinguishable from *simulans* and *piercei.*)

Genus **PSEUDOPANURGUS** Cockerell.

1. **Pseudopanurgus fuscipennis** (Crawford).

The only records of this bee are the two cotypes collected by Mr. J. C. Crawford, at West Point, Nebraska, September 18 and 20, 1903, on *Bidens chrysanthemoides.* It is suggested that this species is likely to prove the same as *P. aethiops* Cresson, but we have not been able to make a direct comparison, so leave it as distinct. *Protandrenopsis* Crawford, however, is the same as *Pseudopanurgus* Ckll.

Genus **PROTANDRENA** Cockerell.

1. **Protandrena asclepiadis** Cockerell.

Entire State except in Transition zone of Sioux County; West Point, Weeping Water, Carns and Dundy County, Nebraska, flying during July on *Petalostemon violaceus, Solanum rostratum, Melilotus alba, Symphoricarpos occidentalis* and *Medicago sativa. P. bancrofti* Dunning, described from Colorado, is the female of *P. asclepiadis* Ckll., and the species should be known by the older name, as above.

2. **Protandrena cockerelli** Dunning.

Distribution the same as that of *asclepiadis*; specimens of both sexes are from Lincoln, Neligh, Carns, and Benkelman, Nebraska, taken July 1-26, on *Petalostemon violaceus, Solanum rostratum and Cassia chamaechrista.* The two species may be separated thus:

FEMALES.

Tubercles and a spot on tegulae yellow; supraclypeal area black, a yellow subtriangular mark occupying the upper half of clypeus; wings heavily clouded . . . . **asclepiadis** Ckll.

Tubercles black, tegulae rufo-piceous, without yellow; supraclypeal area mostly or entirely yellow, sides of face with yellow spots, the upper half of clypeus yellow, with two black spots; wings much less clouded . . . . **cockerelli** Dunning.

MALES.

Tubercles and a spot on tegulae yellow; upper margin of yellow area on face uneven, highest medially; less shiny . . . **asclepiadis** Ckll.

Tubercles dark, tegulæ rufo-piceous, without yellow; upper margin of yellow area on face perfectly straight, more shiny. **cockerelli** Dunning.

Appendix:—For the convenience of students, we wish to take the opportunity of here describing another interesting new *Spinoliella.*

Spinoliella hesperia n. sp

♀ Length 7 mm; clypeus, except two very small basal black dots, labrum, mandibles except tips, supraclypeal area, dog's ear marks and lateral face marks extending above level of antennæ and running up in a narrow line along orbits nearly to vertex, bright yellow. Vertex with two large, irregular yellow spots, which occupy most of the area between the lateral ocelli and the eyes. Antennæ black, with the front of the scape yellow and the flagellum brownish beneath. Thorax black, the prothorax with a narrow transverse yellow band, the tubercles, postscutellum and a spot at base of tegulæ also bright yellow, rest of tegulæ black. Wings clear, nervures dark brown. Abdomen black, the middle of segments 1-4 with very broad, bright yellow transverse bands, interrupted medially on 1 and 2, very broadly on 2, complete on 3 and 4. Legs black, with all the knees, first four tarsi, anterior tibiæ and intermediate tibiæ, except for large spots on each side, yellow. Front, whole of thorax, legs and tip of abdomen with short, erect, fairly dense gray pubescence.

♂. Length 6 mm; face marked as in ♀ except that the lateral marks run broadly up to vertex and end truncately, and there are no yellow spots on vertex. Antennæ wholly yellow except for a black line on top of scape which extends, though broken, along the basal half of flagellum also. Segments 1-6 of abdomen with complete transverse bright yellow bands, broad on 1-4 with the anterior middle notched and with an oblong black mark near the posterior margin on each side. Legs bright yellow, except for black marks on the back of anterior and intermediate tibiæ, femora, trochanters and coxæ, the posterior coxæ, trochanters, and basal two-thirds of femora black.

Types:—Southern California, ♂, ♀. (Collector unknown). Also a single ♂ paratype from type locality. This species is notable for the light face in both sexes. The general appearance of *S. hesperia,* is much like *S. scutellaris,* known only in the ♂, which was described from the same State, but it is much smaller and differs in several minor details. The hind legs of the ♂ are suggestive of *S. pictipes,* which is, however, otherwise quite different.

Notes on Lachnus platanicola Riley.

By Warren T. Clarke, Auburn, Alabama.

Early in November of last year, 1906, the writer's attention was drawn to certain aphids found upon limbs of the sycamore in the city of Montgomery, Alabama. On investigation, these proved to be representatives of the species *Lachnus platanicola,* first described and figured by Riley, in American Naturalist, 17, p. 198; 1883. Townsend, in Insect Life 1, pp. 197-198, 1888, and Oestlund, Aphidæ of Minnesota, p. 32, 1887, also made brief mention of the insect, while Weed, in Insect Life, 3, pp. 286-287, re-describes and figures it very fully. Reference is made to the above bibliography for technical description of this giant among the Aphididæ, the notes here given being merely intended to record its presence in Alabama as late as November, 1906, and further to record certain observations made upon it at the time.

My notes read as follows: "*Lachnus platanicola* Riley, on *Platanus occidentalis* (sycamore). Localities, Montgomery County, Randolph County and Mobile County, Alabama. Invariably on under sides of smaller limbs. Colonies large and much exudation of 'honey dew.' Found present apterous and winged viviparous females and winged males."

The process of viviparous reproduction was observed. The fully grown female (measuring in the two cases noted, four millimeters in width at the middle of the abdomen and seven millimeters in length), apparently became restless, waving her long hind legs about in the air and swinging on the limb, from side to side, her inserted beak acting as a mooring point. This active and somewhat convulsive movement was kept up for three or four minutes and then the female became quiet. At the end of another three or four minutes activity would again begin, but not so pronounced as at first, and the young insect began to appear. At this point the activity of the mother *Lachnus* ceased and the new-born insect freed itself from her by its own efforts. For a few minutes after birth the young *Lachnus* remained quiet, apparently resting from its exertions and drying, and then backed away and found some unoccupied spot on the twig. Here it settled down, and in about an hour after birth it had inserted its beak into the twig and had begun to suck. Observations were made for two hours in each case during the warmest time of the afternoon, from one to three o'clock. In both instances three young were born in the time mentioned. In one case, observations were continued for one hour longer, from three to four, and no young were produced during this period. It was not possible for me to make further observations, but the evidence so far seems to point to the young being born only during the heat of the day.

While the winged males were present no oviparous females were seen and no eggs were found.

This *Lachnus* was not generally distributed through Alabama last year, for the winter found but the three trees with the insect present, though many sycamores were examined.

It seems to be of no special economic importance.

* * *

I SHALL be glad to undertake the determination of American Syrphidae for any of the readers of the NEWS.—RAYMOND C. OSBURN, Columbia Univ., New York.

A New Genus of Atropidae.

By SAMUEL E. WEBER, Lancaster, Pa.

The Atropidæ were originally set apart from the Psocidæ as possessing neither wings or ocelli, but in the three genera *Psoquilla* Hagen, *Dorypteryx* Aaron, *Psocinella* Bangs (*Psocatropos* Ribaga) we find in all of them one pair of rudimendary venated wings. To these I may add a fifth genus with fully developed ocelli and possessing two pairs of venated wings: we have then, as the generic term implies, an Atropid with ocelli.

OCELLATARIA gen. nov.

Fully developed ocelli. Head oblong. Emarginate on the vertex. Clypeus small. Lips prominent. Eyes not prominent, composed of small ocelli. Antennæ filiform longer than body, 18 to 30 articulations beyond two stronger basilar joints. Palpi four-jointed, the last joint tapered to a point at apex. Maxillæ tridentate, meso- and metathorax free. Two pairs of rudimentary venated wings. Femora not dilated. Tibiæ half as thick as femora, and longer than femora. Tarsi three jointed, the first joint longest, the second shortest. Claws bidentate. Body very scantily clothed with hair.

This genus differs from all the other Atropidæ in that it has not a prominent clypeus, and its head is more oblong than that of other genera and is more prominent between the eyes, and is emarginate on the vertex. The ocelli contrast this genus most strikingly from other described Atropidæ. A further difference in structure is the two pairs of venated wings found in *Ocellataria,* which does not occur in any of the other genera.

Ocellataria gravinympha sp. nov.

Length (♂) 1.7-2 mm.; (♀) 2.-2.3 mm. (Fig. I.)*

The ground color of the body is of a faint yellowish-white covered by a fine granular layer of bluish grey, most profuse on the ventral surface of the abdomen and on the legs, which are darker than the other parts of the body, with the exception of the borders and veins of the wings, which, like the eyes, are black. The head appears lighter in color than the other parts of the body; it is darker from the line of the eyes and ocelli back and lighter from that line to the mouth A few white hairs clothe the head, clypeus and lips, and are more numerous over the latter. Maxillary palpi white. Antennæ white A fox-red band extends forward from the eye and becomes obsolete at the root of the antennæ. A light fusion of the same color is found surrounding the anterior ocellus, extending towards the clypeus The ocelli are mounted in three beautiful rounded dark cherry-red bodies

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*This figure without description appeared in an article on "The Possible Dissemination of Tubercle Bacilli by Insects," N. Y. Med. Journal, Vol. lxxxiv, No. 18, p. 884, November 3, 1906. This paper is an example of the economic importance of the Psocidæ.

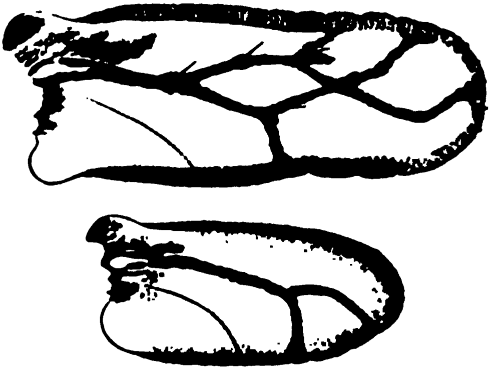

Fig. 1.—1st and 2nd wings of *Ocellataria gravinympha*.

The prothorax marked on the side by a fox-red stripe. Superior surface of femora darker than the inferior. The mesothorax is light reddish-brown on the dorsum, and towards the anterior border contains a light median spot Under the wings it is white The metathorax is marked the same on the dorsum. The wings are of a transparent glassy white structure. The margins and veins black The first segment of the abdomen is white, the second, third, fourth fifth and sixth are bluish grey on the dorsal surface, the seventh is lighter in color, the eighth and ninth or apical retractive portion of the abdomen is dark. To the unaided eye the general color effect of the insect is that of a dark greyish spotted body with a faint yellowish head With the hand glass, appear the beautiful red mounted ocelli and black eyes and yellow head, dark thorax and wings, the white first and seventh abdominal segments with the rest bluish grey, which renders the insect of a spotted appearance.

The first pair of femora are slightly dilated and are larger than those of the middle or hind pair The front tibiæ are slightly longer than the femora, the tarsi nearly as long as the tibiæ, the first tarsal joint is longer than the combined length of the second and third The middle pair of tibiæ are about one-fifth longer than the femora; the tibiæ are one fourth longer than the tarsi; the first tarsal joint one and one half times longer than the second and third joints combined. The tibiæ of the hind pair are nearly twice the length of the femora; the tarsi two and one-half times longer than the tibiæ; the first tarsal joint twice as long as the second and third. The legs are sparsely clothed with short hair. The first and second joints of the tarsi are armed with two little spurs on the under side of their apices. Claws, bidentate. Two pairs of venated hyaline wings; the first pair three times as long as wide, and reach to, or extend half way over the first segment of the abdomen. The attachment to the mesothorax extends over nearly the whole width of the wing at its base. It is vested by a heavy aculeate border and veins. The large single vein takes its origin about the middle of the base, then makes a slight turn towards the anal side, then to the costal side, when it bifurcates to form a lozenge-shaped discoidal cell about the middle of the wing. On the anal side it sends off a branch nearly at right angles which extends to the border. On the costal side further towards the apex another

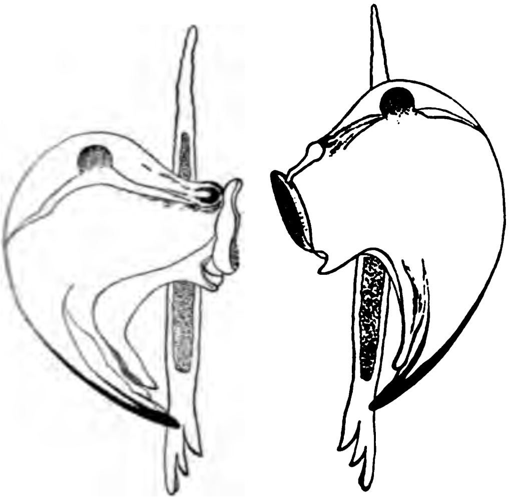

Fig. 2.—Mandibles and maxillæ of *O. gravinympha.*

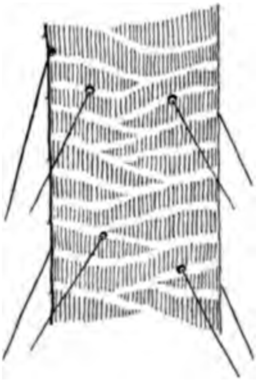

Fig. 3.—Portion of posterior tibia showing arrangement of epiderm.

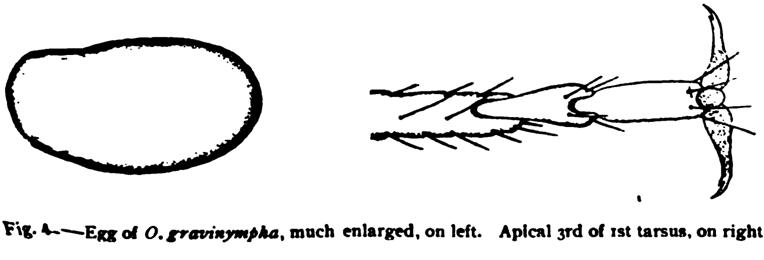

Fig. 4.—Egg of *O. gravinympha*, much enlarged, on left. Apical 3rd of 1st tarsus, on right.

branch is sent out, very heavy at its origin and very light for two-thirds of the distance to the margin. At the apical end of the discoidal cell two branches are given off, one extending to the costal, and the other to the anal, side of the apex of the wing. On the border of the wing on each side occur from 4 to 5 infundibulæ, each one of which is clothed with a small seta. A few larger setæ are scattered over the veins. The wing presents an undulating surface; the attachment at base is high, then it descends and rises again at the basilar third at about the bifurcation of the vein, which is the highest point of the wave, then it curves downward through middle of discoidal cell takes a gradual rise, and comes to a higher point at the apical end of discoidal cell, after which it runs flat to the apex. The pos-

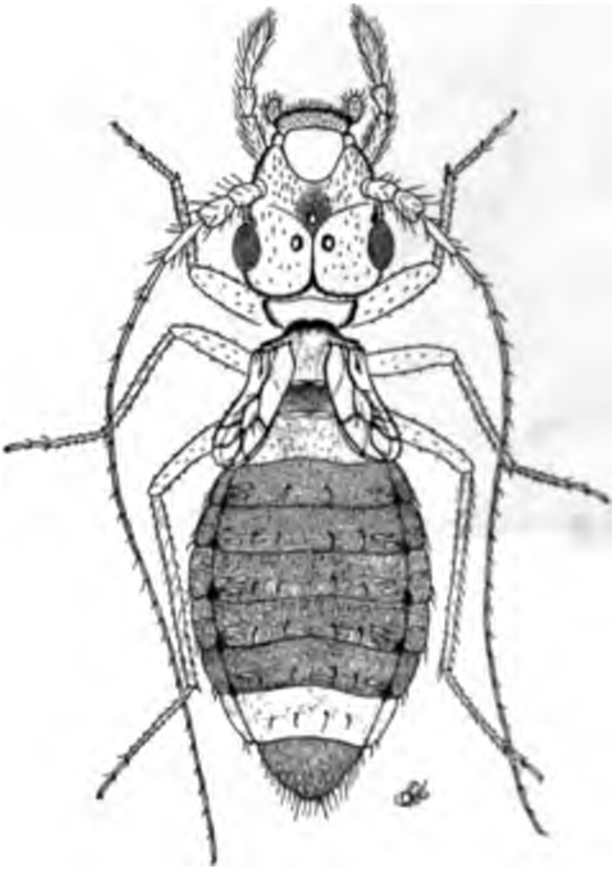

Fig. [illegible] *[illegible] [illegible]nympha* (?).

terior wings are shorter and narrower than the anterior pair, the costal margin nearly straight. Apex obtuse. A simple vein extends from the base obliquely towards the anal side and bifurcates, one simple branch extending to the apical margin on anal side, the other to anal border beyond the middle, forming a triangular cellule.

Habitat.—Lancaster, Pa. It is an indoor species.

Types.—Two males and one female, No. 46,844, U. S. N. M.

In its movements it is unlike many other Psocids, since it generally walks about slowly and runs only when disturbed. It has a peculiar lateral or duck-like motion of the head when walking which is not possessed by any other species known to me in this family. It does not jump. It does not spin. I have found this species to remain in a cellar, where they were placed in several boxes of bones, and to breed in the original boxes for three seasons. They were also found on wine jugs, barrels and boxes in the same cellar after this introduction. This is the only instance known to me where Atropidæ remained where dampness existed. I have noted this form active on April 28, and it is probably the first Psocid to resume activity in the spring. One of the most remarkable features in the life history of this species, in some instances, is the early development and deposition of eggs which occurs already in stage III, the next to last moult. When these gravid female nymphs are seen running among the males and females, the picture is so striking that they seem to be a widely different species, for they are much larger than even their nongravid mothers, and are of a bright yellow color.

The eggs are eliptical in shape. The adult usually deposits from five to seven and glues them fast in cracks or other favorable places. They hatch in from eight to ten days, according to conditions.

The nymphs moult apparently three times. A great divergence in the development occurs between male and female, since the former is born blind and the latter has from three to five ocelli as it issues from the ovum. These blind males have no trace of any development toward the formation of eyes in stage I, and the eye does not develop until late in nymphal life; they frequently have but two or three ocelli by the time the latter part of stage III is reached; while at the same time the ocelli—between the eyes—become discernible through the appearance of glassy facets, but do not have a fully developed base. The antennæ, at birth, have six or seven articulations aside from the two larger constituting the base. The wings are also much slower in developing than those of the female. The antennæ after the first moult—stage II—are composed of from twelve to fifteen articulations beyond the base. Small wingpads now make their appearance. The males are smaller and receive the peculiar color marks of the abdomen, which is not the case with the female until the last moult setting forth the adult form.

The lack of development of the eyes in the male nymphs is accompanied by remarkable development of some other parts, e. g. some specimens are found with the antennæ having even more articulations than are found in the imago, while the eye is rudimentary. The nymphs of both sexes in stage III have two-jointed tarsi and from nineteen to twenty-three articulations in the antennæ. The female nymphs in this stage are of a beautiful faint yellow, with the head of an amber tint. The thorax is of a light reddish-brown color. The ocelli are plainly marked and the eyes are not fully developed The antennæ contain sixteen to twenty-four articulations. The tarsi two-jointed. This latter structural difference, and the short, broad, and uniformly bright yellow-colored abdomen of the gravid female nymph contrasts it readily from the regular female imago of the same species, which is marked as shown in Fig. 1.

Five large gravid female nymphs taken September 5, 1905, and put in a bottle, were soon thereafter found to have deposited three eggs, but they did not hatch. In these gravid nymphs the tarsi were two-jointed. Antennæ from sixteen to twenty-four articulations beyond the basilar portion Wings large but no venation. By September 8th they were moulted and had the color of the adult female as per Fig. 1.

These facts of early oval development occur undoubtedly without the intervention of male and female, and indicate that we have the data of parthenogenesis exemplified in this species.

The Bumblebees of Southern Maine.

By JOHN H. LOVELL, Waldoboro, Maine.

The bumblebees of New England have received very little attention since the publication of the late Dr. Packard's paper in the Proceedings of the Essex Institute, in 1864. In this contribution he lists the following species as found in Maine: *B. fervidus, pennsylvanicus, terricola, virginicus, vagans* and *ternarius,* the last on the authority of Cresson. Of the species of *Psithyrus* he mentions collecting several female specimens of *P. ashtonii* at Brunswick, Maine. It is the object of the present paper to enumerate the species taken in southern Maine, at Waldoboro, and to give a few of the more important flower-records. The earliest date in spring on which females of *Bombus* have been observed is April 30th, when B. *terricola* and B. *ternarius* have been found visiting the aments of *Salix discolor.* During the autumn of the current year (1906) I made a special effort to determine the latest date any of the species continued on the wing. On September 18th, a mild, clear day, I found no bumblebees on the asters and goldenrods, though there were many honeybees at work on the latter. In a field of red clover (*Trifolium pratense*), however, specimens of *B. consimilis, fervidus* and *borealis* were still fairly common. Very likely they continued to fly for a few days longer, but on the night of September 24th there was a hard frost, killing all tender garden plants and turning black nearly all of the clover heads. The following day was clear, warm and calm and butterflies were still flitting about over the clover field, but no bumblebees were to be seen.

Apis mellifera L.

1758. *Apis mellifera* L., Syst. Nat. (10th ed.), p. 576.
1761, *Apis mellifica* L., Faun. Suec., p. 421.

Dalla Torre in his catalogue, following the law of priority, has given preference to the earlier name *mellifera,* which has also been adopted in the publications of the U. S. Department of Agriculture. The question of the nomenclature of the honeybee has been fully discussed by Mr. Frank Benton in Proc. Ent. Soc. Wash., 6, 71, 1904. "Why Linnæus chose to change the name is not apparent," but it is suggested by Mr.

Benton that as there were no zoological canons to interfere. Linnæus considered that *mellifica* (honey-maker) was more appropriate than *mellifera* (honey-bearer.) Now after the lapse of nearly 150 years the older name is very properly restored.

All of the workers of *A. mellifera* which I have taken in this locality are black or German bees, or are hybrids between this and the Italian variety. The black bee is so called because the entire dorsum of the abdomen is black, while pure Italians have yellow bands on the basal three abdominal segments. By selection bee-culturists have also produced four and five-banded Italians. Hybrids, which can be easily distinguished, are marked with only one or two yellow bands, but hybrids may be entirely black. Wild colonies living in hollow trees in the forest are not uncommon in this locality.

The writer has two colonies of black bees which are kept largely for purposes of observation. In the spring of 1906 they left the hive for their first flight on March 28th, a mild sunny day, with a temperature of 48° F. in the shade. Numbers of the bees which alighted on the snow became chilled and perished. The preceding month of January was exceptionally warm throughout the Northern States, and at Zanesville, Ohio, in latitude 40°, the maximum temperature on the 21st and 22d was 70° and 71° F. respectively, and the honeybees flew as freely as in the springtime, "carrying great loads of pollen from the maples." They were also flying on six other days in this month. At Waldoboro they still continue to leave the hives on every mild day in November. Providing the temperature be sufficiently high, the honeybee then may fly any day in the year. Strictly speaking, the domestic bee does not hibernate, since they consume food throughout the winter, and can endure a temperature below 40° F. for only a few days. (For experiment in chilling bees see Gleanings in Bee Culture 34, 202, Feb. 15, 1906.)

BOMBIDAE

Bombus terricola Kirby

1837. [illegible] Kirby, ♀. Faun. Bor. Am., 4, 273.
1863. [illegible] Cr., ♀ ♂. Proc. Ent. Soc. Phil., 2, [illegible]
1864. *Bombus terricola* Packard, ♀ ♀, ♂, Proc. Essex Inst., 4, 112

♀.—Scutellum sometimes entirely black, but often yellowish; margin of the 5th abdominal segment fringed apically with yellow hair. The female has been taken on *Salix discolor*, April 30; *S. bebbiana*, May 13; *Rhodora canadensis*, May 28; *Aesculus hippocastanum*, May 31; *Rosa humilis*, July 10, and a variety of other flowers as *Cornus alternifolia*, *Viburnum alnifolium* and *Gaylussacia resinosa*.

☿.—All of the workers have the scutellum black, but the apical margin of the fifth segment is fringed with yellow. Collected on *Rosa humilis*, July 10; *Aralia hispida*, July 16; and later on many midsummer and August flowers, as *Solidago bicolor*, *Gaultheria procumbens* and *Vicia cracca*.

♂.—As remarked by Packard, the male might easily be mistaken for a worker; but the clypeus, which in the worker is smooth, is densely bearded with yellow hair in the male; the scutellum is sometimes black, but often with an admixture of yellow hair. Found visiting the flowers of *Aralia hispida*, July 15; *Epilobium angustifolium*, July 23; and later on *Solidago bicolor* and *Eupatorium perfoliatum*.

Bombus ternarius Say.

1838, *Bombus ternarius* Say, ♂, Boston Jour., Nat. Hist., 1, 414.
1863, *Bombus ternarius* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 2, 104.
1864, *Bombus ternarius* Packard, ♀ ☿, ♂, Proc. Essex Inst., 4, 116.

♀.—the yellow pubescence on the scutellum is in some specimens separated into two spots as in *B. bifarius*, which is probably only a variety of this species. Captured on *Salix discolor*, April 30; *S. bebbiana*, May 12; *Aesculus hippocastanum*, May 31; also on *Rhodora canadensis* and *Gaylusaccia resinosa*.

☿.—The workers are much smaller than the females and the front is nearly black. Taken on *Rhus typhina*, July 10; *Solidago*, September 8; also on *Aralia hispida* and *Eupatorium perfoliatum*.

♂.—The form of the male is more slender than that of the worker. I have taken it only on *Solidago bicolor*.

Bombus fervidus Fabr.

1798, *Apis fervida* Fabr., Suppl. Ent. Syst., p. 274.
1808, *Bombus fervidus* Fabr., Syst. Piez., p. 352.
1863, *Bombus fervidus* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 2, 93.
1864, *Bombus fervidus* Packard, ♀ ☿, ♂, Proc. Essex Inst., 4, 110.

♀.—Collected on *Rhodora canadensis*, May 28; *Aesculus hippocastanum*, May 31; *Falcata comosa*, August 22; and *Trifolium pratense*, September 18.

☿.—On *Pontederia cordata*, July 20; *Falcata comosa*, August 22; also on various garden flowers.

♂.—The male has been taken on the pasture thistle from July 30th to September 18th.

Bombus borealis Kirby.

1837, *Bombus borealis* Kirby, Faun. Bor. Am., 4, 272.
1864, *Bombus borealis* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 3, 41.

Bombus borealis differs from *B. fervidus* in the following characters: the pubescence is tawny yellow; the clypeus is smooth and shining, impunctate; the face between the clypeus and ocelli is clothed with pale yellow and the vertex with tawny yellow pubescence; the yellow pubescence of the thorax does not extend downward upon the pleura, and the black band between the wings is wider. *B. fervidus* has the pubescence lemon yellow; the clypeus sparingly punctured; the front black except for a few yellow hairs above the insertion of the antennæ, the vertex black; and the pleura is largely yellow. Both sexes and the workers have been taken in this locality, but they are much rarer than the corresponding forms of *fervidus*. I have no record of the capture of the females in spring. The workers have been taken on *Pontederia cordata*, which blooms from July 21st to August 10th; on *Vicia cracca*; and on *Trifolium pratense*, September 18th.

Bombus consimilis Cr.

1864, *Bombus consimilis* Cr., ♀, Proc. Ent. Soc. Phil., 3, 41.

This is our most common species of *Bombus*, and according to Cresson it occurs also in Massachusetts and Canada. I have compared the local bees with an authentic set of specimens received from Mr. H. L. Viereck, with which they very closely agree. In one instance a female of this species has only the basal middle of the second segment yellow, resembling *B.* [illegible] Cr., of which I have specimens from New Haven, Conn.

♀.—On the inflorescence of *Salix bebbiana*, May 13; *Lonicera ciliata*, May 18; *Rhodora canadensis*, May 28; *Clintonia borealis* and many other plants.

☿.—Taken on *Rhus typhina,* July 10; *Epilobium angustifolium,* July 23; *Pontederia cordata,* July 20; *Falcata comosa,* August 22; and *Trifolium pratense,* September 18.

♂.—The male may be easily distinguished from the worker by a long tuft of pale yellow hair below the antennæ. On *Pontederia cordata,* July 20; and *Epilobium angustifolium,* July 30.

Bombus bimaculatus Cr.

1863. *Bombus bimaculatus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 92.

This species is probably only a variety of *B. vagans* Sm., from which it differs chiefly in having a round black spot on each side of the second abdominal segment. This character is, however, variable, and I have specimens which have the second segment entirely yellow. The female of *B. bimaculatus* is rather common on *Rhodora canadensis* and I have also taken it on *Diervilla trifida.*

Psithyrus ashtonii Cr.

1864. *Apathus ashtoni* Cr., ♀, Proc. Ent. Soc. Phil., 3, 42.
1864. *Apathus ashtoni* Packard, ♀, Proc. Essex Inst., 4, 118.
1896. *Psithyrus ashtonii* D. T., Cat. Hym., 10, 565.

The female was taken on *Vaccinium,* June 16; and *Solidago juncea,* August 4. The male, which is undescribed, is smaller than the female, and the yellow and black pubescence is similarly distributed, except that the first segment is clothed laterally with lemon-yellow hair. Observed on *Epilobium angustifolium,* July 23; *Aralia hispida,* July 27; and the goldenrod, August 21. In fresh specimens the pubescence is a bright lemon-yellow, fading with age to grayish-yellow.

Psithyrus laboriosus Fabr.

1804. *Apathus laboriosus* Fabr., ♀, Syst. Piez., p. 352.
1854. *Apathus citrinus* Sm., ♂, Cat. Hym. Brit. Mus., 2, 385.
1863. *Apathus laboriosus* Cr., ♀, Proc. Ent. Soc. Phil., 2, 111.
1863. *Apathus citrinus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 112.
1863. *Apathus contiguus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 112.
1864. *Apathus citrinus* Packard, ♂, Proc. Essex Inst., 4, 119.
1864. *Apathus contiguus* Packard, ♂, Proc. Essex Inst., 4, 119.
1903. *Psithyrus laboriosus* Robt., ♀, ♂, Trans. Am. Ent. Soc., 29, 178.

The female has been collected on *Pontederia cordata,* July 21; *Inula helenium,* August 6; and *Solidago,* September 3.

In Proc. Ent. Soc. Phil. 3: 247, 1864, Walsh makes the following observation: "I may add here, that as I have recently captured 17 ♂ ♂ of *Apathus citrinus* Smith in company with 4 ♀ ♀ of *A. laboriosus* Fabr., and as the ♀ of the former and the ♂ of the latter species appear to be unknown, I incline to believe them to be the sexes of one and the same species." The male resembles *Bombus perplexus*, and was so determined for me some years ago by an eminent entomologist; it is common in this locality on *Epilobium angustifolium* from July 20th to August 18th.

Psithyrus contiguus Cr. differs from the male of *P. laboriosus* only in having the first two instead of the first three segments lemon-yellow. In 1887 (Syn. Hym. N. Am. p. 307), Cresson considered it as only a variety of *P. citrinus*. After a careful examination of a rather large series of the males of *P. laboriosus* I find that the third segment may be entirely black, partially black, or that the yellow pubescence may be mixed with black. *P. contiguus* is doubtless only an instance where the yellow fails entirely; it has been taken July 30th on *Carduus odoratus*.

CERATINIDAE.

Ceratina dupla Say.

1837. *Ceratina dupla* Say, ♀ ♂, Bost. Jour. Nat. Hist., 1, 387.
1864. *Ceratina dupla* Cr., ♀, ♂, Proc. Ent. Soc. Phil., 2, 383.

I take this opportunity to place on record the occurrence of *C. dupla* in this locality. The female has been taken from July 4th to August 21st on the rose, thistle and goldenrod. I have also specimens of both the male and female of this species, and of the male of *C. tejonensis* Cr. from Elkhart, Indiana, collected by R. J. Weith.

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Melalopha inornata (Neumoegen).—Last September Professor V. A. Clark sent me a number of larvæ, which had been found defoliating cottonwood (*Populus*) trees at Prescott, Arizona. The larvæ pupated on the way, and I was not able to determine them until recently, when a couple of fine *M. inornata* emerged. According to Packard's great work on the Notodontidæ, the precise locality of this species was unknown, and nothing had been recorded about its transformations.—T. D. A. Cockerell.

The Differentials of Three North American Species of Libellula.

By Philip P. Calvert.

In the News for January, 1907, p. 30, was mentioned that, during our recent trip to Mexico, *Libellula flavida* (Hagen, not Ramb.), new to that country, was taken. This capture has led me to study this species, in order to include it in the Supplement to the Odonate part of the Biologia Centrali-Americana.

In a footnote to page 73 of Prof. J. B. Smith's List of the Insects of New Jersey (27th Annual Report, New Jersey State Board of Agriculture, Supplement, 1900), I stated, "I have examined Rambur's presumed type of *flavida* at Oxford, England. It is identical with *plumbea* Uhler, and therefore different from *flavida* Hagen, which latter will require a new name." For *flavida* Hagen (nec Rambur), I now propose

Libellula comanche.

The nearest allies of *Libellula comanche* are *L. flavida* Ramb. and *L. cyanea* Fabr. These three species agree in having the discoidal triangle of the hind wings cross-veined, supratriangular cross-veins usually present on the front wings, usually absent on the hind, one cubito-anal (submedian Selys*) cross-vein, a bicolored pterostigma, and abdominal segment 8 of the female perfoliate.

The differentials of these three species follow. Having before me 7 ♂, 4 ♀ each of *comanche* and of *flavida*, I have used the same number of *cyanea* for this comparison; all the available males of *comanche* are pruinose.

Character.	*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler).	*L. cyanea.* (*quadrupla* Say.)
Vertex at apex.	With a yellow or orange spot.	Without such a spot.	Without such a spot.
Frons ♂	Cream-yellow.	Bluish-black.	Greenish-brown (young) to bluish-black.
Frons ♀	Cream-yellow to orange.	Reddish-yellow to greenish-brown.	Greenish-yellow to olive.

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* The Comstock-Needham wing-vein nomenclature is here employed, the Selysian synonyms being added in parentheses.

Character.		*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida*. (*plumbea* Uhler.)	*L. cyanea*. (*quadrupla* Sa
Nasus	♂	Pale greenish-yellow.	Olive to blackish-brown.	Brown to blac
	♀	Pale greenish-yellow.	Yellow to olive.	Greenish-yello olive.
Labrum	♂	Yellow.	Yellow to black, very narrowly orange on free edge.	Brownish, narr orange on edge, to ent black.
	♀	Yellow to orange.	Yellow.	Yellow to gree yellow.
Darker basal coloring of the wings.		Ochraceous extending distad halfway, more or less, to first antecubital, and halfway, more or less, to cubito-anal cross-vein (almost absent in the front wings of a Californian male.)	A dark ochraceous or blackish-brown subcostal streak to first, second or third antecubital; cubital (submedian) space ochraceous halfway to (front wing), or reaching distal to (hind wing), the cubito-anal cross-vein.	A blackish-br subcostal st extending to first or se (front wing the second third (hind w antecubital; ital space o ceous halfwa (front wing nearly reac (hind wing) cubito-anal vein
Subcostal space distal to the darker basal coloring	♂	Uncolored.	Distinctly yellow.	Uncolored
	♀	Pale yellow.	Distinctly yellow.	Yellow.
First and second series of postcubital spaces		With barely a trace of yellow (absent in a Californian male).	Yellow or ochraceous.	Pale yellow, marked in first series
Brown at apex of wings of female reaching proximad		1.5 mm., halfway to distal end of stigma	3.5 mm., to distal end, or to distal fourth, of stigma	2-2.5 mm. thirds way to tal end of stig
Pterostigma		♂. Proximal two-thirds cream-yellow, remainder blackish-brown.	♂, ♀. Proximal three fourths to five sixths, or almost entirely, ochre-yellow, remainder blackish-brown.	♂, ♀. Proximal to three-fi cream-yellow mainder blac brown.

Character.		*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler.)	*L. cyanea.* (*quadrupla* Say.)
Pterostigma.		♀. Proximal half ochraceous, remainder blackish brown.		
Number of cells in internal triangle, front wing.		8–4 (6 and 5 equally the more frequent).	7–4 (5 most frequent).	5–3 (3 most frequent).
Posttriangular rows to level of separation of M_1 (principal sector), and M_2 (median sector), front wing.		4	4–3 (3 most frequent.	3
Do., hind wing.		3	3–2 (2 followed by 3 most frequent).	2–2 followed by 3 (2 most frequent)
Number of rows of cells between M_4 (short sector) and supplement next below, hind wings.		2	2–1 (1 most frequent).	1
Length, in mm.				
Abdomen	♂	36–32.	31.5–28.	30–27.5.
	♀	34–31.	31–27.	27–25.
Hind wing	♂	42.5–37.	38–36.	36–33.
	♀	41–40.	40–36.	35–33.
Costal edge of stigma, front wing.	♂	5–3.5.	6–5.5.	5–4.5.
	♀	6–5.5.	6–5.5.	5–4.5.
Width of hind wing at right angles to costa at level of posterior angle of discoidal triangle.	♀	12–10.5.	10–9	10.5–9.3.
	♀	11–10.	10.5–8.5	9
Maximum width of head	♂	8–7.	7–6.7.	6.8–6.25.
	♀	7.7–7.5.	7	6.3
Maximum width of thorax.	♂	8–6.	6–5.5.	6–5.5.
	♀	7–6.7.	6 4–5.	5.7–5.2.

	L. comanche, nom. nov.	*L. flavida.*	*L. cyanea.*
	(*flavida* Hagen.)	(*plumbea* Uhler.)	(*quadrupla* Say
Distribution:	Montana; Yellowstone; Ontario in California (July, 1 ♂, Snodgrass); Dallas, Waco, Round Mountain (June, Schaupp, 4 ♂, 4 ♀), and Pecos River, Texas; Santa Rosalia Springs (August, Calvert, 2 ♂), in Chihuahua, Mex.	N. Jersey to Georgia. (I have studied 3 ♂, 1 ♀, Haddonfield, August, Rhoads, and 1 ♂, Lakehurst, July, Davis, in N. J., 1 ♂, vicinity of Philadelphia?; 1 ♀, Mitchell Co., N C., July, Skinner; 2 ♂, 2 ♀, Greenville, S. C., Patterson and Calvert.)	Manchester, New Hampshire to Greenville, South Carolina, west to Indiana.

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Notes on some species of Geometrids.

By Harrison G. Dyar, Washington, D. C.

In the April number of Entomological News, Mr. John A. Grossbeck has some notes on some of Hulst's types of *Geometridae*, which takes the form of a criticism of my own notes on these types. Mr. Grossbeck has been studying the material at his convenience, and it is not surprising if he has been able to correct my own more hurried notes. I am, however, disposed to maintain my original position in respect to some of the determinations.

Hydriomena curvilinea Hulst.

I cannot concur in Mr Grossbeck's separation of *curvilinea* and *occidens.* I have a good series of the species from the northwest, and the differential characters noted come within the range of variation.

Hydriomena amerata Hulst

Mr Grossbeck admits that one of the types is *Petrophora defensaria* Guen., but would hold the name on the other type.

I think, however, that the name should fail, for if one type is not *defensaria,* it is *convallaria.* I feel quite sure that there is not a third species so marked.

Somatolophia umbripennis Hulst.

Mr. Grossbeck has discovered that the type is a ♂ without antennæ and with a ♀ abdomen of another species cleverly attached. Making the necessary correction, *Somatolophia* Hulst becomes a synonym of *Selidosema,* but the species *umbripennis* is distinct from *haydenata.* I have gone over my material and am able to recognize both species. They are remarkably alike, not only in markings, as Mr. Grossbeck admits, but also in color, for of my eleven *umbripennis* (without ♂ hair pencil), several are fully as light in color as the *haydenata.* The description of the larva of *Alcis haydenata* Pack. (Proc. U. S. Nat. Mus., XXV, 390, 1903) must be credited to *Selidosema umbripennis* Hulst.

Cymatophora festa Hulst.

Mr. Grossbeck finds this to be a synonym of *Macaria sequiferaria* Walk., instead of *Delinia pulveraria* Hulst, as found by me. I cannot explain this discrepancy, except through some mistake on my part. The species are certainly different enough.

Selidosema correllatum Hulst.

Mr. Grossbeck divides the species, limiting it to the Colorodan type, and describing the Californian type as *pallescens.* In the U. S. Nat. Mus, is also a type of *correllatum* from California and two other specimens. I suppose these represent *pallescens,* but the specific distinctness of it is scarcely obvious to me, if the specimen that I have from Ormsby Co., Nevada (C. F. Baker) is the true *correllatum,* as I suppose. Much more distinct is *sericeata* Hulst, of which I have a type from Prescott, Arizona, and also four recent specimens from Williams, Ariz. (Schwarz and Barber). Mr. Grossbeck is surely in error in citing the species as a synonym to *correllatum.*

Mr. Wm. Schaus has been collecting in Central America since September, 1905. His present address is San José, Costa Rica.

Our species of Plagodis Hübn.

By RICHARD F. PEARSALL, Brooklyn, N. Y.

The species which fall under this genus are rather well defined, and it would seem quite unnecessary to revise them. A curious mingling of two species under one name has occurred, however, in the case of *keutzingi* Grote. As Dr. Packard was about to publish his monograph in 1876, Professor Grote sent him a specimen, with description, he says, and name, *keutzingi* for publication (Can. Ent., VIII, p. 112). Doctor Packard mingled with it specimens from various places, which he described under the name of *keutzingaria* Pack., and figured them (Mono. plate XI, fig. 44), referring to the Grote specimen, in a few descriptive lines as a darker form. This drew a vigorous protest from Grote (Can. Ent., VIII, p. 154), who insisted that his name, *keutzingi*, should hold. Whether as the result of this or not, I do not know, but a figure of the Grote specimen appears (Mono. plate XIII, fig. 51), and in listing them (Dyar) *keutzingaria* Pack. is made a synonym of *keutzingi* Grote. Here the error occurs. I have taken both in the Catskill Mountains, the latter rarely, and they are about as distinct, one from the other, as could well be. Both names cannot have a place on our list as separate species, and as that of Professor Grote is recognized as entitled to priority, I propose for the other species the name *altruaria* with *keutzingaria* Pack. as its synonym. On the occasion of a recent visit to Reading, I saw in the collection of the late Doctor Strecker a ♂ and ♀ of a species, a single ♂ of which, taken at Scranton, Pa., came to me some two months ago, through the kindness of Mr. M. Rothke, of that city. They were labeled *Plagodis purpuraria* Pack. Doctor Packard may have given this name to Doctor Strecker, but he never published any description of it. The species must be quite rare, for I have never seen it in any other collection. Those in the Strecker collection were also taken in Pennsylvania. How markedly different from our other species it is, the following description, under the name selected by Doctor Packard, will show:

Plagodis purpuraria n. sp.

Expanse 29-30 mm.; forewings deeply notched at anal angle, as in *keutzingaria,* but narrower; palpi reddish-purple, tipped with orange; front, vertex, base of patagia, and costa at base, deep reddish-purple; collar gray, tinged with lilac; antennæ yellow, tipped with violet; thorax in front, and patagia, bright brownish orange, which rapidly fades into pale yellow posteriorly; abdomen pale yellow, a few scattering scales, centrally, of jet black, at tip and beneath orange, the whole washed thinly with violet; forewings soft, bright, brownish orange without basal lines, striations, or discal spots. This color ceases abruptly, extradiscally at costa, about two-thirds out, thence inwardly in a straight line to cell, at base of vein 3, it runs nearly straight to inner border of wing, thus forming a slight angle. Inwardly along this margin there is a diffuse shading of brownish from costa to vein 3, below which black and violet shades are intermingled and form the suggestion of a vine, while outwardly a wide border, broadest centrally, of lilac scales (changing to white at costa and along it to apex), disclosing as it fades out about half way to margin, the bright, brownish orange ground color which succeeds it, submarginally from apex to notch. At inner margin the subterminal space is nearly filled with a cloud of black and purple scales, washed with lilac. Fringe orange above notch, purple within it. Hind wings pale yellow, marginally washed with orange. On inner margin two thirds from base, a blotch of orange, black and purple scales indicate the termination of a shadowy line crossing the wing centrally. Before anal angle a few black and purple scales, overspread with lilac, not so prominent as on fore wings. Fringe orange, shading into lilac at anal angle. No discal dots. Beneath forewings bright orange above cell, from base to apex below cell, almost white. A diffuse band of orange crosses both wings centrally. Hind wings pale orange basally, pale yellow to margin, beyond central cross band. No discal dots on either wings, legs brownish orange washed with purple.

Type ♂ in my collection. The ♀ in the Strecker collection should be a type and the ♂ a co-type, but I have no descriptive notes of the former, and while it presents no difference in color or markings from my ♂ that I could discover, I refrain from giving it that standing at present. The species is a beautiful one, as will be seen, and its markings approach in style the *emargataria* Gn. That species is larger, a brown or *café au lait* color, slightly strigate, with prominent discal dots and quite different in appearance.

Kempii Hulst, the type of which is a ♀, seems to me an extreme varietal form of *alcoolaria* Gn. It is a fresh specimen, with the ground color paler, less strigate or mottled, with the cross lines more sharply drawn; otherwise the same. I would list our species as follows:

Serinaria H-Sch.
=*subpriruria* Walk.
=*flosculaœria* Grote.
var. *rosaria* Grote.
Keutzingi Grote.
=*nigrescaria* Hulst.
Altruaria Pears.
=*keutzingaria* Pack.

Fervidaria H-Sch.
=*excurvaria* *Mor*
Alcoolaria Gn.
var. kempii Hulst.
Phlogosaria Gn.
Emargataria Gn.
=*arrogaria* Hulst
Purpuraria Pears.
Approximaria Dyar.

◆

THE VITALITY and power of resistance of the sheep tick, *Melophagus ovinus* Linn. Being interested in a woolpulling establishment, I have had the opportunity of observing the terrible punishment inflicted upon the sheep ticks, after the sheepskins are brought into the shop, and how they come out whole and very much alive after said punishment. The skins are brought in all day up to six o'clock P. M., and are put into large cement vats with running water, in which the skins are totally submerged; they remain in these vats over night, and the following morning are run through a scrub machine, a machine for cleaning the wool, with steel blades on a cylinder, revolving nine hundred times per minute; these blades and the force of water make the wool as white as the driven snow, taking out burs and dirt. The skins are then put into a hydro extractor revolving twelve hundred times a minute, from which the skins come out very nearly dry. They are then painted on the pelt side with a very strong solution of sulphide of sodium, folded, wool out, and laid in piles twelve high; in this position they remain for at least twenty four hours, when they go to the pullers' beams, and it is here that the pullers have their trouble, for unless they see the ticks first, the latter will get under their clothing wherever there is a chance, and try to make up the time lost in the two or three days' fast. They finally succumb, however, after the wool is pulled and goes into the drying machine, where the temperature is two hundred and fifty degrees Fahrenheit.—FRANK HAIMBACH, Philadelphia.

Records of Orthoptera from the Vicinity of Brownsville, Texas.

BY JAMES A. G. REHN.

Although the Orthoptera of the Brownsville region have been well examined and reported on at length by Caudell,* the following records may add desirable information regarding the occurrence of certain species not included in that paper, and, taken with the work mentioned above, give a comprehensive summary of the Orthoptera of that region. Three species are here added to the fauna of the United States and nineteen are additional to Caudell's paper, in which forty-six were recorded.

The material collected by Mr. Schaeffer is in the collection of the Brooklyn Institute of Arts and Sciences and that obtained by Prof. Snow in the cabinet of the University of Kansas. The author wishes to thank both of these gentlemen for the privilege of examining the material from these institutions.

FORFICULIDAE.

Spongiphora apicidentata Caudell.

Isabel, August 5. (Schaeffer.) 1 ♂.

Apterygida linearis (Eschscholtz).

Brownsville, June. (Snow.) 1 ♀.

BLATTIDAE.

Pseudomops oblongata (Linnaeus).

Brownsville, June. (Snow.) 1 ♀.

This specimen represents true *oblongata*, agreeing fully with individuals of this species from Morelos, Mexico, and Costa Rica.

This record is the first of the species within the United States.

Chorisoneura texensis Saussure and Zehntner.

Brownsville, July. (Snow.) 1 ♂.

Pycnoscelus surinamensis (Linnaeus).

Brownsville, June. (Snow.) 1 ♀, 1 nymph.

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* Bull. Brooklyn Inst. Arts and Sciences, I, No. 4, pp. 105-116, pl. vi-vii, 1904.

Homoeogamia bolliana Saussure.

Brownsville, June. (Snow.) 1 ♂.

This specimen is more infuscate than usual in central Texan specimens, but it is not the extreme dark form to which Caudell has applied the name *nigricans* (l. c. p. 107).

Latindia schwarzi Caudell.

Brownsville, June. (Snow.) 1 ♂.

This specimen is slightly smaller than Caudell's original measurements, the tegmina being 5.5 instead of 7 to 8 millimetres in length.

MANTIDAE.

Stagmomantis carolina (Linnaeus).

Brownsville, June. (Snow.) 1 ♂.

Bactromantis virga Scudder.

Brownsville, June. (Snow.) 1 ♀.

Theoclytes chlorophaea (Blanchard).

Brownsville, June. (Snow.) 1 immature individual.

This specimen has been compared with an adult from Mexico.

PHASMIDAE.

Diapheromera persimilis Caudell.

Brownsville, June. (Snow.) 1 ♀.

As far as can be determined from the female sex this specimen appears to belong to Caudell's species.

ACRIDIDAE.

Apotettix brevipennis Hancock.

Esperanza Ranch, Brownsville, Aug. 13. (Schaeffer.) 1 ♀

This species was described from Paige, Texas.

Paratettix texanus Hancock.

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, July. (Schaeffer.) 1 ♀.

Orphulella picturata Scudder.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens are not as highly colored as Galveston individuals.

Opeia pallida Bruner.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens appear to belong to this species, which was described from Montelovez, Coahuila, Mexico. The lateral carinae of the pronotum are slightly converging cephalad as described by Bruner.

Chortophaga viridifasciata (De Geer).

Brownsville, June. (Snow.) 1 ♂.

Encoptolophus fuliginosus Bruner.

Esperanza Ranch, Brownsville, May and August 1st. (Schaeffer.) 2 ♂.

These specimens are referred to this species with a little uncertainty, but almost entirely on account of the distance between the type locality (Colonia Garcia, Chihuahua, Mexico) and that given above. In structure these specimens appear to fully agree with the original description and tally thoroughly in the dimensions.

Encoptolophus texensis Bruner.

Brownsville, June. (Snow.) 1 ♂. Esperanza Ranch, Brownsville, August 17th. (Schaeffer.) 1 ♀.

These specimens appear to be quite typical, except that the two females vary in the length of the tegmina and of the caudal femora.

Spharagemon cristatum Scudder.

Brownsville, June. (Snow.) 1 ♀. Esperanza Ranch, Brownsville, June. (Schaeffer.) 1 ♀.

The Esperanza Ranch individual has the pronotal crest higher caudad than in the other specimen, the same portion being bulbous dorsad. The Brownsville specimen has this region more rugose and with the arch lower as well as the caudad angle of the pronotum less produced though acute.

Tomonotus aztecus (Saussure).

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens have been compared with Mexican specimens.

Mestobregma texanum (Saussure).

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, June 25th and August 3d. (Schaeffer.) 1 ♂, 1 ♀.

Schistocerca alutacea (Harris).

Between Alice and Brownsville, July. (Schaeffer.) 1 ♂.

Schistocerca obscura (Fabricius).

Brownsville, June. (Snow.) 1 ♂.

TETTIGONIDAE.

Orchelimum vulgare Harris.

Brownsville, June. (Snow.) 1 ♀.

Xiphidion fasciatum (De Geer).

Brownsville, June. (Snow.) 1 ♂, 2 ♀.

Stipator sp.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

GRYLLIDAE.

Gryllotalpa borealis Burm.

Esperanza Ranch, Brownsville, May 25th. (Schaeffer.) 1 ♂. This specimen is one of the long-winged type (*columbia*).

Ellipes minuta (Scudder).

Brownsville, June. (Snow.) 1 ♀.

Nemobius neomexicanus Scudder.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

Nemobius sp.

Brownsville, June. (Snow.) 1 ♂.

Gryllus luctuosus Serville

Brownsville, June. (Snow.) 1 ♂. This individual belongs to the form *abbreviatus*.

Anaxipha exigua (Say)

Brownsville, June. (Snow.) 1 ♂.

Oecanthus quadripunctatus Beutenmuller

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, August 18th. (Schaeffer.) 1 ♀.

Oecanthus pini Beutenmuller.

Brownsville, June (Snow.) 1 ♀.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MAY, 1907.

We have always made it a point to take our subscribers and well-wishers into our confidence and tell them our aims and hopes and what we propose to do. It has always been our ambition to improve the NEWS in every way in our power and not increase the price of subscription. It is our wish at the present time to publish at least fifty pages a month, and give twenty-five full plates in each volume. In the last number issued we had fifty-two pages and six full-page plates. The articles we are publishing are of great scientific interest and we are getting many papers of this class. The increased number of pages will enable us to get them out promptly.

We are also endeavoring to have the copies mailed by the first of each month. We are thus doing all we can, and the rest must be done by our subscribers. Every new subscription we get enables us to improve the NEWS, so it is to the interest of all to aid us as far as possible in this way.

We believe we are publishing the best monthly entomological journal in the world at such a moderate price. We would like more color plates, and trust an increased subscription list will enable us to achieve this very desirable addition to the value of the NEWS.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

WILL name Micro-Lepidoptera—all families except Phycitinae.—W. D. KEARFOTT, Montclair, N. J.

A. L. MELANDER, Agric. Exper. Station, Pullman, Washington, will name Empididæ and fossil Diptera.

HENRY ENGEL has removed from Pittsburgh, Pa , to New Brighton, Pa. Correspondents are requested to kindly address letters and parcels as follows: Merrick Museum, 5th Ave. and 11th St., New Brighton, Pa

FARMINGTON—Ah, there's that old poem about husking bees. I always did like that.

DUMLEY—Husking bees? What do you mean?

FARMINGTON—Why, were you never in the country during the season of husking bees?

DUMLEY—No. How in the world do you husk a bee?

THE LAKE LABORATORY of the Ohio State University, located on Cedar Point near Sandusky, is designed to provide a meeting ground for teachers and students of biology, to afford opportunity for the investigation of the biology of the lake region, and for giving certain courses of instruction in biological subjects.

Entomology—field and laboratory course, including instruction in collecting, mounting and identifying insects in connection with studies in life history and anatomy Excellent opportunities for life-history studies are offered both on aquatic and terrestrial forms.

The course of instruction will open June 24th and close August 2nd, the laboratory being open longer to students desiring to continue work

SAMIA RUBRA AND GLOVERI The question of the food plant having the property of changing the color values of various species has been long admitted, and in dealing with S *rubra*, I was interested in the fact that larvæ fed on birch at Ottawa from eggs furnished by me from wild *rubra* emerged as imago of a dark gray, having little trace of the reddish tint which is so noticeable with *rubra*; this led me to the further experiment of trying to feed *rubra* on tamarack which is the recognized food of *gloveri*: I parted a batch of eggs, placing some on its native food plant *Ceanothus* and the balance on tamarack [illegible] the growth of those on the tamarack was very slow, they only passed the first stage when those of the *Ceanothus* were passing the third, and continued to develop in the same ratio During the last stage they were offered Douglas fir and entirely forsook the tamarack for that food, on which they seemed to thrive better

than previously. Unfortunately I only secured one pupa from this brood, and, as it is doubtful if I may this year have a chance of again breeding this insect, may I ask some of our western enthusiasts to try the experiment this year to see if the food plant is the only distinguishing factor in the color and markings of this variable species?—J. W. Cockle.

Doings of Societies.

At the meeting of the Feldman Collecting Social held Philadelphia, February 20, 1907, there were seven members present.

Mr. Harbeck exhibited his collection of the genus *Tabanus,* and remarked that Professor Hine had gone over his specimens of *nigrovittatus* and had picked out from them a number of specimens of *conterminus.*

Professor J. B. Smith exhibited slides of lepidopterous wings colored with eosin, bringing out the venation very clearly.

Mr. Haimbach has made some experiments with the coloring of wings of a number of micros, according to the method given to him by Professor Smith, with more or less success, and will attempt here to give a brief outline of it, and would be pleased to hear from others who probably have had even better success. The wings are carefully nipped off, and put in alcohol for a few minutes, then transferred into Eau de Labarraque, which is the bleaching agent; in this they are left until all the color is bleached from the wings, and then put into clear water for a short time, then back into alcohol, and from that into the eosin, where they must remain until the desired result is reached; in the case of small micros two hours will suffice, but in the larger moths twenty-four hours are required. Judgment and practice are both essential features, and each species must be treated according to its individual requirement. After the wings have been long enough in eosin, they are transferred into alcohol again to wash out the color from the wings, being careful not to leave it too long, so that the veins will not lose their color. They are then mounted on slides with Canada balsam and xylol, and left to dry, which, unless artificially done, will require a week or ten days.

Frank Haimbach, *Secretary.*

At the meeting of the Feldman Collecting Social held March 20, 1907, at the residence of Mr. H. W. Wenzel, No. 1523 S. Thirteenth Street, Philadelphia, there were seven members present, and Mr. Heiner visitor.

Mr. Harbeck exhibited seven species of Diptera new to New Jersey list as follows: *Hermetia illucens* Linn., taken at Trenton, VII, 7; *Temnostoma trifasciata* Robertson, Anglesea, VI, 11; *Rivellia boscii* Desv., Trenton, V, 21; *Euthera tentatrix* Loew., Clementon, V, 30; *Sturmia nigrita* Town., Riverton, V, 19; *Protocalliphora splendida* Macq., Ashland, VII, 16, and *Discocerina parva* Loew., Ashland, V, 13.

Mr. Haimbach gave an account of the vitality and power of resistance of the sheep tick, *Melophagus ovinus*, which account will appear in another part of this number.

Mr. Haimbach exhibited the following fifteen species of recently described Micro-lepidoptera: *Crambus placidellus* Haimb., *Crambus daeckellus* Haimb., *Thaumatopsis fernaldella* Kearf., *Epinotia haimbachiana* Kearf., *Hemimena bittana* Busck, *Ancylis diminutana* Kearf., *Phalonia rana* Busck, *Phalonia atomosana* Busck, *Hysterosia merrickana* Kearf., *Carposina fernaldana* Busck, *Gelechia nigrimaculella* Busck, *Mompha engelella* Busck, *Mompha stellella* Busck, *Epermenia imperialella* Busck, and *Amydria margoriella* Dietz.

Mr. Daecke exhibited a specimen of *Pachnobia monochromatea* Morr., taken at Brown's Mills Junction, V, 20, 04, and a specimen of *Spogostylum cephus* Fab., taken by Mr. Haimbach at Roxborough, Philadelphia, VII, 8, 06. The type of this species is from South America, and is listed from Ga. Macq., Va., O. S., Cal., and St. Augustine, Fla., Johnson.

FRANK HAIMBACH, *Secretary*.

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ERRATA.

Mr. H. W. Wenzel wishes to note the following correction in the minutes of December 19, 1906, ENT. NEWS, XVIII, p. 68, in his reference to the color variation in the genus *Phanaeus*, it should read *Phanaeus igneus* instead of in the genus *Phanaeus*.

Pages numbered 164 and 165 in the NEWS for April, 1907, should have been 165 and 164 respectively. After line 6, page 140, insert "type of Walker's *carbonarius* in the British Museum collec."

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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List of the Lepidoptera of Five-Mile Beach, N. J.

By FRANK HAIMBACH, Philadelphia, Pa.

(PART I)

Five-Mile Beach, which includes Anglesea, Wildwood and Holly Beach, is situated at nearly the extreme southern end of New Jersey, being about five miles northward from Cape May. The flora is southern in character, and while there are no very tall trees, flowers grow in wild profusion in the narrow strip of woods, which extends over the whole length of the island, and for the botanist, as well as the entomologist, this place is a veritable paradise.

I believe that Five-Mile Beach has been more thoroughly surveyed entomologically than any other place so near to Philadelphia, and probably no other place in the country enjoys a better patronage by entomologists than this island.

It is the principal hunting ground of nearly all the Philadelphia collectors; for this reason I have thought it desirable to prepare a list of the species to be found there, giving dates of capture and other available data.

I have collected for about 10 years at this place, and besides my own collection I have gone over the collections of Messrs. Philip Laurent and F. Weigand, both of whom have been enthusiastic collectors there. Prof. Smith's List of the Insects of New Jersey has been a great help to me in compiling this list, and Prof. Smith has also very kindly gone over this list, and has added quite a number of records of his own captures.

From the notes which follow, it will be seen that many of the recorded captures were made "at sugar"; now this may appear easy, and in a sense it was so, as all that was to be done was to go about with a brush, and paint about a dozen trees, and begin at once to make the haul, and such a one I have never seen at any other place, as every trunk that had been painted was literally covered with moths, and one could take his choice; but this had to be paid for with blood, for the enemy was so much in evidence everywhere, and in such numbers that it was torture to exist, yet my friend, Mr. Weigand, and myself stuck to it for hours at a time, after which we would go home to have our wounds dressed, and after pinning specimens for several more hours we would retire, but not to sleep that sound sleep which we deserved after our struggles but to lie awake scratching and moaning, and incidentally to ward off further attacks from the rascally mosquitoes that had followed us to our room. However, the recollection is not an unpleasant one, when we look over our collections, and see some of the pretty specimens which we bottled.

The meadows also have furnished many desirable specimens in our too short vacation days.

Part II, of the list of the Micro-lepidoptera, I hope to have ready in a short time; the reason for withholding it now is that I have quite a number of species which up to the present time I have not been able to identify, and no doubt there will be some new species found among them.

I hope this little list will find favor with my brother collectors, and I would like to see some of them come out with a list of the species of their respective chosen orders. Then the general collector would know pretty well what he might expect to find at this garden spot of the Atlantic coast, though it is with sorrow that I note the improvements on the islands which are coming thick and fast, and which to the collector mean ultimate destruction.

PAPILIONOIDEA.

NYMPHALIDÆ.

DANAINAE.

Danais plexippus Linn., May to Oct., larvae on milk weeds.

NYMPHALINAE.

Agraulis vanillae Linn., taken at Cape May and Seven-Mile Beach, a probable inhabitant.
Euptoieta claudia Cram., recorded from Cape May along coast to Hudson Co., June to Oct.
Argynnis idalia Dru., July.
" *cybele* Fabr., July.
" *myrina* Cram., Sept. 13.
" *bellona* Fabr., July.
Phyciodes tharos Dru., July 2 to Aug. 1.
" " var. *marcia* Edw., Sept. 13 to 20.
" " var. *morpheus* Edw., July 26.
Grapta interrogationis Fabr., July 11.
" " var. *fabricii* Edw., Aug. 6.
" " var. *umbrosa* Lint., Aug. 23.
" *comma* Harris, Sept. 11.
" " var. *harrisii* Edw.
" " " *dryas* Edw., May 21, Aug. 6.
Vanessa antiopa Linn., throughout the year.
Pyrameis atalanta Linn., July 11, Aug. 17, Sept.
" *huntera* Fabr., Sept. 20.
" *cardui* Linn., Sept. 20, Aug. 17.
Junonia coenia Hbn., common July to Oct.
Limenitis ursula Fabr., July 15.
" *archippus* Cram., July.

SATYRINAE.

Debis portlandia Fabr., July.
Neonympha canthus Bd. and Lec., June.
" *eurytris* Fabr., June to Sept. Several specimens with large ocelli, like Florida specimens.
Satyrus alope Fabr., var. *maritima* Edw., common July to Sept.

LYCAENIDÆ.

LYCAENINAE.

Thecla halesus Cram., recorded from Cape May, and may occur at Five-Mile Beach.
" *favonius* S. and A., Anglesea, Sept. 1 (2 spmn.).
" *melinus* Hbn., July 4 to 20.
" *calanus* Hbn., July 3.
" *liparops* Bd. and Lec., July 17 to 26.
" *damon* Cram., 7, 28.
" *irus* Godt., April 26 to June.
" *niphon* Hbn., May 7
Chrysophanus hypophlaeus Bdv., May to Sept.
Lycaena pseudargiolus Bd. and Lec., July 3 to Aug. 27.
" " var. *lucia* Kirby, April 30.
" " var. *marginata* Edw., May.
" *comyntas* Godt., May to Sept.

PAPILIONIDÆ.

PIERINAE.

Pieris protodice Bdv., Sept. and Oct.
" " var. *vernalis* Edw., May.
" *rapae* Linn., March to November.
Anthocharis genutia Fabr., recorded from Seven-Mile Beach, and [illegible] doubt occurs at Five-Mile Beach.

Calopsilia eubule Linn., in swarms, in Sept.
Colias philodice Godt., June to Sept.
Terias nicippe Cram., Sept. to Nov.
" *lisa* Bdv., June to Oct.

PAPILIONINAE.

Papilio ajax Linn., one spmn. seen by Mr. H. W. Wenzel at Anglesea.
" *philenor* Linn., July.
" *polyxenes* Fabr., April to Oct.
" *troilus* Linn., April to Sept., the commonest *Pap.* on the island
" *glaucus* Linn., have no actual records, but no doubt occurs with *turnus*.
" *glaucus* var. *turnus* Linn., May to Sept.

HESPERIDAE.

Ancyloxypha numitor Fabr., May to Sept.
Pamphila zabulon Bd. and Lec., June 19, Aug. 21
" *campestris* Bdv., July 26, Sept. 20.
" *phylaeus* Dru., Aug. 20.

Pamphila otho S. and A., var. *egeremet* Scud., June 3, Aug. 27.
" *peckius* Kirby, May 30, Aug. 8.
" *cernes* Bd. and Lec., May to Sept.
" *verna* Edw., June 23, Aug. 12.
" *metacomet* Harris, July 27.
" *panoquin* Scudd., June to September, common in salt meadows, and on flowers of button-ball.
" *dion* Edw., Anglesea, July 7.
" *aaroni* Skinner, June 15, Aug. 22 to 27, common in salt meadows, and is easily taken in the morning, in flowers of *Convolvulus.*
" *fusca* G. and R., June 9.
" *viator* Edw., Anglesea, July 25.
Pyrgus tessellata Scudd., Aug. to Oct.
Nisoniades juvenalis Fabr., May to Sept.
Pholisora catullus Fabr., May to Sept.
Eudamus pylades Scudd., May to Aug.
" *bathyllus* S. and A., May to Aug.
" *lycidas* S. and A., June to July.
" *tityrus* Fabr., May to Sept.
" *proteus* Linn., has been taken by Mr. Hornig.

SPHINGOIDEA.

SPHINGIDÆ.

MACROGLOSSINAE.

Hemaris thysbe Fabr., July 26.

CHOEROCAMPINAE.

Amphion nessus Cram., May 30.
Pholus pandorus Hbn., Aug. 5, 6.
Deilephila lineata Fabr., May to July.
Ampelophaga myron Cram., Aug. 2.
" " var. *cnotus* Hbn., Aug. 2.

SPHINGIDAE.

Phlegethontius quinquemaculata Haw., Aug.
" *carolina* Linn., Aug. 6 to 29. Have seen hundreds of this and preceding species on electric light poles at Holly Beach.
Ceratomia undulosa Wlk., June, on bark.

SATURNOIDEA.

SATURNIDAE.

Samia cecropia Linn., June to August, at light.
Callosamia promethea Dru., June to Aug.

Actias luna Linn., Aug., 8.
Telea polyphemus Cram., June to Aug.
Hyperchiria io Fabr., June to Aug.

CERATOCAMPIDAE.

Eacles imperialis Dru., June to Aug., common at light.
" " var. *didyma* DeB., July 15.
Citheronia regalis Fabr., June and July, not uncommon at ligh have found the larvae on oak.
Anisota stigma Fabr., Anglesea, at light.

BOMBYCOIDEA.

SYNTOMIDAE.

Scepsis fulvicollis Hbn., flies by day, on flowers.

LITHOSIIDAE.

Crambidia pallida Pack., Aug., 20, Sept. 3, at light.
Hypoprepia miniata Kirby, May 28, Sept. 11, at light.
" *fucosa* Hbn , Aug. 3 to 12, at light.
Cisthene subjecta Wlk., Anglesea, July 15, Aug. 21, larvae on *liche*

ARCTIIDAE.

Eubaphe aurantiaca Hbn. var. *ferruginosa* Wlk., June 14, August fields.
" *aurantiaca* Hbn. var. *brevicornis* Wlk., Aug. 21.
Utetheisa bella Linn., May 20, July 4 to Aug. 20, in meadows.
Haploa clymene Brown, July 14 to 22, in woods
Estigmene acraea Dru , May to Sept.
Diacrisia virginica Fabr., June and July
Isia isabella S. and A., April to June, August.
Phragmatobia fuliginosa Linn , Anglesea, at light
Apantesis virgo Linn , August 24, at light
" *arge* Dru., July 14, in fields.
" *nais* Dru , June and Sept.
" *vittata* Fabr., June, at light.
" *radians* Wlk., Aug 3, at light.
" *phalerata* Harris, Aug 3, at light
Ammalo tenera Hbn , Aug 22, in fields
Halisidota tessellaris S and A , July 30, at light

NOCTUIDAE.

NOCTUINAE.

Acronycta lobeliae Gn , May 30, at light, Aug 3 to 5, at sugar
" *interrupta* Gn., Aug. 20, at sugar
" *furcifera* Gn., Aug 2 to 20, at sugar.

Acronycta clarescens Gn., Aug. 4 to 27, at sugar.
" *hamamelis* Gn., Aug. 22 to 27, at sugar.
" *ovata* Grt., Aug. 4 to 27, at sugar.
" *inclara* Smith, at Holly Beach, by Mr. Weigand.
" *impleta* Wlk., Aug. 2, at sugar.
" *xyliniformis* Gn., July 25 to Aug. 2, at sugar.
" *oblinita* S. and A., Aug. 3 to 5, at sugar.
Arsilonche albovenosa Goetze, Anglesea, at light.
Microcoelia diphtheroides Gn. var. *obliterata* Grt., by Mr. F. Weigand.
Polygrammate hebraeicum Hbn., by Mr. Weigand.
Chytonix palliatricula Gn., at Anglesea, by Prof. Smith.
Platysenta videns Gn., Aug. 14 to 27, very common, at sugar, Sept. 5.
Anorthodes tarda Gn., Aug. 20, at sugar.
Caradrina miranda Grt., Anglesea, Aug. 14, Sept. 4.
Perigea epopea Cram., Aug. 2 to 27, common, at sugar.
" *vecors* Gn., Anglesea, Sept 16.
" *sutor* Gn., Aug. 20, at sugar,
Oligia festivoides Gn., Anglesea, by Prof. Smith, June.
" *chalcedonia* Hbn., Aug. 12, sugaring.
" *versicolor* Grt., Aug. 20. "
" *grata* Hbn., Aug. 27. "
Hadena dubitans Wlk., Aug. 20 to 27, "
" *burgessi* Morr., Cape May Co., 1 spec., at light, Smith list.
" *devastatrix* Brace, June and July.
" *arctica* Bdv., Aug. 12, at sugar.
" *cariosa* Gn., July 4, by Mr. Weigand.
" *modica* Gn., Aug. 27, at sugar.
" *miseloides* Gn., July 27, Aug. 27, at sugar.
" *turbulenta* Hbn., Aug. 22, at sugar.
Dryobota illocata Wlk., Aug. 22, "
Hyppa xylinoides Gn., Aug. 20, "
Euplexia lucipara Linn., Aug. 20, "
Dypterygia scabriuscula Linn., by Mr. Weigand.
Pyrophila pyramidoides Linn., Aug. 6 to 20, at sugar.
Helotropha reniformis Grt., Aug. 22 to 27, at sugar.
" " var. *atra* Grt., Aug. 27, at sugar.
Prodenia commelinae S. and A., Aug., June 1.
" *eudiopta* Gn., Aug. 27, at sugar ; Sept. 5.
" *ornithogalli* Gn., Aug. 14 to 27, at sugar ; Sept. 4.
Laphygma frugiperda S. and A., Aug. 20, at light.
" " var. *obscura* Riley, Aug. 15, at light.
Rhynchagrotis anchocelioides Gn., Anglesea, Sept.
" " var. *brunneicollis* Grt., July 1, Aug. 20, at sugar.
Agrotis ypsilon Rott., Aug. 14 to 22, at sugar.
" *geniculata* Morr., Cape May Co., 1 spec., Smith list.

Peridroma occulta Linn., Aug. 20 to Sept 5, at sugar.
" *margaritosa* Haw., Aug. 20, at sugar.
" " var. *saucia* Hbn., July 11, Aug. 27, at sugar.
" *incivis* Gn., Aug. 20, at sugar.
Noctua bicarnea Gn., Aug. 22, at sugar.
" *c-nigrum* Linn., Aug. 27, at sugar.
" *plecta* Linn., Aug. 4 to 6, "
" *clandestina* Harris, May to Sept., under bark.
Feltia subgothica Haw., Aug., at light.
" *jaculifera* Gn., Aug. 20, Anglesea, in field.
" *herilis* Grt., August, at light.
" *annexa* Treitsch., Aug. 6 to Sept.
" *malefida* Gn., Anglesea, Sepr.
Porosagrotis vetusta Walk., Anglesea, Sept. 28.
Euxoa detersa Wlk., Oct. 4, on golden rod.
" *messoria* Harris, June to Sept., larvae on sweet potato.
" *tessellata* Harris, August.
Mamestra meditata Grt., Anglesea, June, Aug., Sept.
" *trifolii* Rott., Aug., on cabbage.
" *picta* Harris, Aug. 22, at sugar.
" *adjuncta* Bdv., Aug.
" *goodellii* Grt., July 26
" *renigera* Steph., July 1 to 6, at sugur.
" *olivacea* Morr., Anglesea, June, Aug., Sept
Nephelodes minians Gn., Anglesea, Aug.
" " var *violans* Gn., Aug.
Tricholita signata Wlk., Sept. 4.
Leucania unipuncta Harv., Aug. 20 to 27, at sugar
" *flabilis* Grt., Aug 5
" *rimosa* Grt., July 25, Aug 4
" *pseudargyria* Gn., Aug. 4, at sugar
" *albilinea* Hbn., Aug. 4 to 27, at sugar; June 1.
" *diffusa* Wlk., Aug. 20, "
" *extincta* Gn., Aug 12, "
" *multilinea* Wlk., Aug. 27, "
" *commoides* Gn., Aug. 4, " and Anglesea, Sept
" *phragmatidicola* Gn., June 10, at light, Aug. 27, at sugar. Sept
3 and 4.
Orthodes crenulata Butl., Aug. 4 to 12, at sugar, 25, at light
Taeniocampa oviduca Gn., Aug 17 to 20, at sugar, Sept 3, at light
" *alia* Gn., April 30
Cucullia asteroides Gn., July 26, at light.
Ommatostola lintneri Grt., Anglesea, Aug. 31 to Sept 2
Hydroecia velata Wlk., Anglesea, July
" *americana* Speyer, Anglesea, July, J. B. Smith
Papaipema cataphracta Grt., Anglesea.

Pyrrhia umbra Hfn., July 27, at sugar.
Scoliopteryx libatrix Linn., Aug. 20 to 27, at sugar.
Orthosia bicolorago Gn., Aug. 2, at sugar, at Holly Beach, Oct., in field.
" *helva* Gt., Aug. 2, at sugar.
Heliothis armiger Hbn., throughout the season.
Rhodophora florida Gn., July 4, Aug. 4, in flower of evening primrose.
Eupanychis spinosae Gn., Anglesea, Sept. 20.
Schinia nundina Dru., Anglesea, Sept. 2.
" *lynx* Gn., Anglesea, Aug. 14 to 16.
" *arcifera* Gn., Holly Beach, Aug. 21 to 27, Sept. 20.
Lygranthoecia marginata Haw., Aug. 27, at light.
Autographa precationis Gn., common in fields.
" *brassicae* Riley, Sept. 5.
" *falcifera* Kirby, May, in fields.
" " var. *simplex* Gn., July 4.
Ogdoconta cinereola Gn., Aug. 6 to 27, at sugar.
Paectes oculatrix Gn., Aug. 4 to 6, at sugar.
Murasmalmus inficita Wlk., Aug. 2 to 6, at sugar; June 16.
" *ventilator* Grt., Aug. 14.
Aletia argillacea Hbn., Aug. 27, Oct. 10.
Eucalyptera bipuncta Morr., Anglesea, J. B. S.
Amolita fessa Grt., June 15, July 21, Aug. 2 to 23, at light.
Doryodes bistriaris Geyer, June to Sept., in salt marsh meadows.
Phiprosopus callitrichoides Grt., Aug. 5 to 14, at sugar.
Rivula propinqualis Gn., July 24.
Erastria synochitis G. and R., June 16.
" *musta* G. and R., August, at light.
" *muscosula* Gn., Aug. 6 to 12, at sugar.
" *apicosa* Harv., Aug. 12 to 20, at sugar.
" *carneola* Gn., Mr. F. Weigand, Sept. 4.
Galgula hepara Gn., Mr. F. Weigand.
" " var. *partita* Gn.
Lithocodia bellicula Hbn., May, Aug., Sept., in meadows; Aug. 12, Sept. 4.
Prothymia rhodarialis Wlk., Anglesea, J. B. S.
Xanthoptera nigrofimbria Gn., F. Weigand, August 31.
" *semiflava* Gn., July 19, flies in black berry bushes.
Chamyris cerintha Tr., July, Sept. 4.
Acontia terminimacula Grt., July 26.
" *biplaga* Gn., Sept. 4.
" *delecta* Walk., Cape May, Smith list.
" *erastriodes* Gn., Aug. 15.
" *candefacta* Hbn., July 12 to 16, August 20 to 27, May 30.
Euherrichia mollissima Gn., Anglesea, July 24; Holly Beach, Aug. 4, F. Weigand.
Spragueia onagrus Gn., Anglesea, May, J. B. S.

Phalaenostola larentiodes Grt., June 15, July 12 to 26, Sept. 4.
Pangrapta decoralis Hbn., July 26 to 29.
Hymia perditalis Wlk., Anglesea, July 21, Aug. 1 to 5.
Homopyralis contracta Wlk., Aug. 6, at sugar, Sept. 3.
" *discalis* Grt., Anglesea, Sept. 4.
" *tantillus* Grt., Anglesea, J. B. S., Sept. 3.
Hypsoropha hormos Hbn., Aug. 1 to 20, at sugar.

CATOCALINAE.

Drasteria erechtea Cram., Aug. 9, at sugar.
" *crassiuscula* Haw., in fields.
" " var. *ochrea* Grt., July 31.
Euclidia cuspidea Hbn., May 11.
Melipotis jucunda Hbn., Aug. 1 to 14, at sugar.
Catocala nubilis Hbn., July 1.
" *elonympha* Hbn., Aug. 6 to 21, at sugar.
" *gracilis* Edw., Anglesea, Aug.
" *minuta* Edw., Aug. 6, at sugar.
" *grynea* Cram., Aug., at sugar.
" *micronympha* Gn., Anglesea.
" *ultronia* Hbn., Aug. 6 to 27, at sugar.
" " var. *mopsa* Hy. Edw., as above.
" " var. *adriana* Hy. Edw., as above.
" *ilia* Cram., Aug. 6, at sugar.
" " var. *uxor* Gn., Aug. 6, at sugar.
" " var. *osculata* Hulst, July 30, at sugar.
" *unijuga* Wlk., Anglesea.
" *cara* Gn., Aug. 4 to 27, at sugar.
" *amatrix* Hbn., Aug. 18 to 27, at sugar.
" " var. *nurus* Wlk., same as above.
" *badia* G. and R., Anglesea.
" *muliercula* Gn., July 25 to Aug. 22, at sugar.
" *neogama* S. and A., Aug., at sugar.
" " var. *snowiana* Grt., July 22, at sugar.
" *piatrix* Grt., Aug.
" *judith* Streck., July 22.
" *angusi* Grt., Aug. 22, at sugar.
Parallelia bistriaris Hbn., May 27, in woods, and Aug. 6, sugar
Remigia repanda Fabr., Aug. 3, at sugar
Celiptera frustulum Gn., June 16, in woods, and Aug. 6 to 12, at
Antiblemma inexacta Wlk., June 17, Aug. 3, at sugar.
Trama detrahens Wlk., July 26.
Pheocyma lunifera Hbn., Aug. 5, at sugar.
Zale horrida Hbn., May 27, in woods, Aug. 21 to 27, at sugar.
Homoptera lunata Dru., July 4, Aug. 12 at 27, at sugar.
" " var. *edusa* Dru., Aug. 3 to 27, at sugar.

HYPENINAE.

Epizeuxis lubricalis Geyer, Aug. 6 to 27, at sugar.
" *americalis* Gn., Sept. 4.
" *rotundalis* Wlk., Aug. 27.
" *aemula* Hbn., Sept. 5.
Zanclognatha lituralis Hbn., Aug. 14, at sugar.
" *theralis* Wlk., July 9.
Hormisa absorptalis Wlk., Aug. 2, at light, Sept. 4.
" *orciferalis* Wlk., Aug. 2 to 13, in trap.
Philometra eumelusalis Wlk., June 19, July 31.
Chytolita morbidialis Gn., July.
" *petrealis* Grt., taken at Burleigh, just across the bridge, J. B. S.
Bleptina caradrinalis Gn., Aug. 6 to 20, at sugar.
" *inferior* Grt., Anglesea, Sept. 12.
Tetanolita floridana Smith, July 26.
" *mynesalis* Wlk., Anglesea, at light, June 10, Aug. 2, Sept. 4.
Renia discoloralis Gn., July.
" *clitosalis* Wlk., Aug. 6, at sugar.
" *factiosalis* Wlk., Aug. 12 to 14, at sugar.
" *flavipunctalis* Geyer, July 2, Aug. 14 to 20, in woods and at sugar.
Heterogramma pyramusalis Wlk., July 29, in woods.
Gaberasa ambigualis Wlk., July 20.
Palthis angulalis Hbn., July 26.
Bomolocha bijugalis Wlk., Anglesea.
Plathypena scabra Fabr., Sept. 20.

NOTODONTIDAE.

Melalopha apicalis Wlk.
Datana ministra Dru., Aug. 3, at light; 21.
" *drexelii* Hy. Edw., Aug. 2, at light.
" *perspicua* G. and R., Aug. 21.
Nadata gibbosa S. and A., var. *doubledayi* Pack., May 27, at light.
Heterocampa pulverea G. and R., May 27, at light.
Harpyia borealis Bdv., June 20, Aug. 20, at light.

GEOMETRIDAE.

HYDRIOMENINAE.

Eudule mendica Wlk., June and July.
Tephroclystia miserulata Grt., June 19, in fields.
Eustroma diversilineata Hbn., July 9 to 17, Sept. 9, at light.
Percnoptilota fluviata Hbn., July 23 to Aug. 6, at sugar; July 19 to Sept. 3.
Mesoleuca intermediata Gn., Aug. 6, in woods.
Hydriomena latirupta Wlk., July 14 to 29, Aug. 27, at sugar.

MONOCTENIINAE.

Haematopis grataria Fabr., Aug. 1, in fields; Sept. 4.

STERRHINAE.

Deptalia insularia Gn., July, in woods.
Cosymbia culicaria Gn., Aug. 6 to 27, in woods.
" *myrtaria* Gn., Aug. 27, in woods.
" *albocostaliata* Pack., July 2 to 30, in woods.
" *pannaria* Gn., Aug. 27, in woods.
Synelys alabastraria Hbn., July, "
" *enucleata* Gn., July, "
Cinglis purata Gn., July 27 to Aug. 6, in fields.
Eois demissaria Hbn., Aug. 6, Sept. 9, "
" *ossularia* Hbn., July 9 to 16, "
" *inductata* Gn., Anglesea.
" *productata* Pack., Aug. 1 to 20, in fields.

GEOMETRINAE.

Chlorochlamys chloroleucaris Gn., July 3 to 26, in woods.
Synchlora rubrifrontaria Pack., June 14, in woods.
" *aerata* Fabr., July 9, Aug. 2, in woods; 20.
" *denticulata* Wlk., Aug. 9.
Anaplodes remotaria Wlk. July 25.

ENNOMINAE.

Physostegania pustularia Gn., July, in woods.
Sciagraphia granitata Gn., May 13, Aug. 27, in woods.
" *mellistrigata* Grt., Anglesea.
" *continuata* Pack., Anglesea, June, Sept. 4.
Melanolophia canadaria Gn., July, in woods.
Ectropis crepuscularia Schiff., April 30, in woods.
Cingilia catenaria Dru., Sept. 20, at light.
Xanthotype crocataria Fabr., July 26 to Aug. 8, in fields; June
" " var. *caelaria* Hulst, June 16, in fields
Gonodontis hypochraria H.-S., Aug. 6, in woods.
" *duaria* Gn., June 10, in woods.
Euchlaena serrata Dru., July 4, in woods.
" *obtusaria* Wlk., June 18, Aug. 20 to 27, in woods.
" *johnsonaria* Fitch, April 20, in woods.
" *marginata* Minot, Anglesea.
Azelina ancetaria Hbn., Aug. 12 to 20, at sugar.
" " var. *peplaria* Hbn., at sugar.
Sysaura infensata Gn., June, Aug. 6, at sugar
" " var. *biclaria* Wlk., Aug. 11, at sugar
Caberodes confusaria Hbn., July 10 to 27, in woods.
Sabulodes transversata Dru., July, in woods, at sugar and light
" " var. *gonata* Gn., same as above
" " var. *transposita* Wlk., same as above.
" " *incurvata* Gn., same as above

(To be continued.)

A new Walking-Stick (Phasmidae) from British Honduras.

By JAMES A. G. REHN.

Sermyle phalangiphora* n. sp.

Type:— ♂ ; Belize, British Honduras. (J. D. Johnson.) [Acad. Nat. Sci. Phila.]

The genus *Pseudosermyle* has been separated from the older *Sermyle* chiefly on the character of the male cerci, *Sermyle* having them simple and *Pseudosermyle* having them with several fingers. Although the cerci are not simple in this new species, the presence of blunt tubercles on the head instead of linear rugosities and the form of the appendage found on the genital opercule induces me to place it in *Sermyle*, especially in view of the fact that a structure analogous to the one here noticed is found in a less pronounced form in the male of *Sermyle physconia*.

The structure of the subgenital opercule and the bifurcate cerci will at once separate this species from any of the forms of *Sermyle* of which the male is known.

Size medium; body bacilliform; surface smooth. Head slightly longer than the pronotum, subequal in width; eyes globose, very prominent; area between the eyes provided with a pair of well spaced low blunt tubercles, a narrow impressed median line extending caudad of a line between the eyes; antennæ about as long as the body, proximal joint nearly half the length of the head, depressed, second joint about half the length of the proximal one. Pronotum distinctly but not greatly longer than broad, a slightly arcuate transverse impressed line is present; mesonotum about four and a half times the length of the pronotum; metanotum, including median segment, half again as long as the mesonotum, the median segment subquadrate and about a fourth the length of the remainder of the metanotum. Abdomen slightly shorter than the head and thorax, all the segments to and including the sixth longitudinal, the first to fifth regularly increasing in length, the sixth about as long as the second, seventh subquadrate, eighth subquadrate, but slightly shorter and narrower than the seventh, ninth slightly longer than the seventh, regularly expanding to about the width of the same segment, the border marginate and with lateral angles rounded and a slight median

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* Φαλαγξ, a finger joint; φορος, that bears.

emargination present; cerci subtrigonal in section at the base, fo at about two-thirds the length, the dorsal arm directed s what dorsad and shorter than the other branch which is prod horizontally, the whole cercus having a strong mesad curve in the type specimen the right one is smaller than the left, the f being more rudimentary than in the left, which is, apparently, norm subgenital opercule short, not reaching the caudal margin of eighth abdominal segment, moderately inflated, from the ventro-ca portion of the opercule is developed a finger-like process as as the ninth dorsal abdominal segment, the apex slightly bro than the shaft, slightly curved dorsad and broadly sulcate on same face. Cephalic femora very slightly longer than the pronc and mesonotum together, proximal flexure distinct; cephalic tibiæ ceeding the femora by about the length of the pronotum. Me femora equal to the mesonotum in length; median tibiæ consider longer than the femora; median metatarsi about as long as remaining tarsal joints. Caudal femora equal to the five prox abdominal segments in length; caudal tibiæ slightly longer than six proximal abdominal segments; metatarsi about as long as remaining tarsal joints.

General color russet, the thorax lined laterad with French gr head with two longitudinal bars on each side, one caudad of the dorsum of the head suffused with olive green, antennæ greenish, vandyke brown; apex of the abdomen suffused dorsad with bl black; limbs faintly and irregularly annulate with raw umber cinnamon.

MEASUREMENTS

Length of body	61
Length of head	3.8
Length of pronotum	3
Length of mesonotum	15
Length of metanotum (including median segment)	11
Length of cephalic femur	19
Length of median femur	15.5
Length of caudal femur	21.

The type is the only specimen of this interesting species s by the author.

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*Whether this condition of the right cercus is normal for the spe or not the author cannot say. It may be that the left is norm larger than the right or the alternative is that the right one in type specimen is stunted. The left cercus is so well proportioned t the possibility of its being an excessive development can hardly entertained.

An Entomological Journey in Mexico, with Special reference to Odonata.

By Philip P. Calvert.

As the manuscript on the Odonata for the *Biologia Centrali-Americana* drew near completion, in July, 1906, it seemed desirable to see some of the insects in their native haunts. Mrs. Calvert and I therefore undertook the journey here described with these two objects in view: to obtain a general idea of Mexico and to make some collections of Odonata, more especially in the northern part of the plateau, that being an odonatologically unknown region. Owing to the limited time at our command, the first of the these objects prevented our remaining long in one place so that our collections must be very incomplete, even for that time of year, while our second object took us to some localities at which we otherwise would not have stopped.

The present article will give our itinerary, for future reference, and some notes and suggestions which may be useful to other entomologists visiting the same country. It should be observed that our tour was made in the rainy season and that by common report the rains were heavier than usual. Partly for this cause, the trains on which we traveled were frequently delayed, the total amount of time thus lost beteween El Paso and Mexico City being 54 hours. Most of this loss occurred in such situations and at such times (after nightfall) as to prevent utilization. We shall not soon forget waiting under the open sky near the station at Aguascalientes from midnight to 4.30 A. M. for a train that was momentarily "expected," through trains here, as in many other places, being one in every twenty-four hours. After Mexico City we had few delays until on the Southern Pacific in Texas. We found the "Excursion into Mexico" of the 1904 edition of Baedeker's "United States" very useful.

The data on the Odonata which we obtained have been incorporated in a Supplement in the *Biologia* volume. Other insects, incidentally gathered, have been placed in the Academy of Natural Sciences of Philadelphia and in the University of Pennsylvania.

ITINERARY.

July 25-27, 1906. At Colorado Springs.

July 29-Aug. 3. At Grand Canyon of the Colorado Ri Arizona.

Aug. 4, 5. El Paso, Texas.

Aug. 6. El Paso, or rather Ciudad Juarez on the oppo bank of the Rio Grande, to Guzman, Chihuahua, 78 miles four-and-a-half hours by the Ferro Carril Rio Grande, Sier Madre y Pacifico. Guzman consists of a railroad station an Chinese-kept hotel combined (accommodations poor) and about a dozen adobe houses close to the Lago, or Laguna, de Guzman. The muddy lake is permanent although its area shrinks in the dry season. It has no outlet. Its banks, near the "town" at least, are chiefly of porous andesite lava in whose cavities were great numbers of the Amphipod, *Hyalella knickerbockeri* var. *inermis*.* A small stream from a spring or well enters the lake near the station; along this stream were nine species of Odonata, including *Plathemis subornata*. Surrounding country largely desert, but there is some grazing land. Long-eared jack rabbits, horned toads, the large Diplopod *Spirobolus*, 6-7 inches long, and *Pepsis* conspicuous members of the fauna.

Aug. 7. Returned to El Paso in the afternoon. The south-bound train to Casas Grandes, the termination of the line, runs on Mondays, Wednesdays and Fridays, the north-bound on Tuesdays, Thursdays and Saturdays.

Aug. 9. El Paso to Nogales, Arizona.

Aug. 10. Nogales to Hermosillo by the Sonora Railway, returning Aug. 11. Hermosillo very hot ([illegible] F. at 5 P. M., 91 F. at 3 A. M.) and depressing. Rio Sonora almost entirely dried up. Very few insects visible, only one species of dragonfly found, the wide-spread *Orthemis ferruginea*, and that in the irrigated plaza in front of the principal church. Good hotel (Arcadia, kept by Americans), electric lights and mule trams on the principal streets, mounted police, etc. Were I to repeat this part of our excursion, I should try Magdalena or Santa Ana, between Nogales and Hermosillo. Information about Sonora, train connections to Hermosillo, etc., was almost unobtainable at El Paso, even at the Southern Pacific ticket agency.

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*For the identification thanks are due to Prof. S. J. Holmes, of the University of Wisconsin.

Aug. 12. At the Mexican town of Nogales (Hotel Modern, fair, French). River dried up. A very small cow pond at the southern end of the town furnished six species of Odonata. A fair number of other insects gathered in grassy fields, and under electric light before sunrise of next day.

Aug. 13. Returned to El Paso.

Aug. 15. El Paso to Chihuahua City by Mexican Central.

Aug. 16-18. Chihuahua City (Casa Robinson, American kept; local report would make Hotel Palacio better). Rain interfered much with collecting, dragonflies scarce (2 spp.). Many wild flowers in blossom, butterflies and beetles abundant west of city, beyond the Santuario (tram-car from chief plaza), which seemed to be the best collecting ground near at hand. Great individual variation in colors of the Scarabaeid, *Cotinis mutabilis,* in same spot, both here and at Santa Rosalia.

Aug. 19, 20. Santa Rosalia. The warm sulphur springs, or baños (Gran Hotel de la Cueva, fair, chiefly patronized by Americans) three miles above the town, on the Rio Conchos, reached by stage, afforded one of the best collecting grounds for dragonflies (12 spp.; northern limit of *Erythrodiplax connata; Libellula flavida* Hagen = *L. comanche* nobis, see Ent News, May, 1907, page 201, new to Mexico) of our trip. Much cotton is raised in the vicinity.

Aug. 21. Torreon (excellent new hotel Salvador) as a base for

Aug. 22. San Pedro in Coahuila. At the railroad station (Monterey division of Mexican Central) are several ponds wherein Odonata breed; imagos of 10 species taken. Between Torreon and San Pedro, a great cotton-raising district.

Aug. 23. En route for Zacatecas.

Aug. 24, 25. Zacatecas, a quaint and picturesque town in the midst of barren, silver-producing mountains, with almost no insects.

Aug. 26, 27. Aguascalientes City. (Hotel Washington, good). Ponds at the public baths near the railroad and also a little farther westward, but on the eastern edge of the town, yielded most of our Odonata (7 spp.)

Aug. 28. Queretaro.

Aug. 29.-Sept. 1. On or near Lake Chapala, chiefly at Ocotlan (Hotel Central, small, unpretending, Spanish, good), also at Chapala (Hotel Arzapalo, excellent). The stage-route from Atequiza to Chapala was out of service, the road being impassable from mud. A steamboat runs every other day, except Sunday, from Ocotlan to Chapala, returning the next day, but the schedule is unreliable. The lake is largely encroached upon by the water-hyacinth (*Eichhornia*). Twelve species of Odonata at these two localities; *Aeshna luteipennis* and *Miathyria marcella* abundant, the former especially so in the streets of the town of Chapala on Aug. 30, between 5 P. M. and sunset, chasing gnats.

Sept. 1-4. In Guadalajara (Hotel Garcia, good) and immediate vicinity. No attention paid to insects as the locality has been worked over by Messrs. Schumann, McClendon and Tower.

Sept. 4. En route Guadalajara to Mexico City. A delay of four hours at Yurecuaro enabled us to gather a few insects ([illegible] spp. Odonata) along the ditches near the station before heavy rain fell.

Sept. 5-7. Mexico City and vicinity. No collecting attempted as others have done much here.

Sept. 8. To Orizaba (Hotel France, excellent, French). No collecting done.

Sept. 9. Back to Irolo and thence to

Sept. 10-13. Jalapa (Gran Hotel, excellent, Spanish). Grand views of snow capped Orizaba and of nearer Cofre de Perote in the early mornings. *Hetaerina tolteca*, previously known from a unique type, found associated with *H. americana* along forest stream. First acquaintance with living Heliconiids (Callicore, *Morpho* etc.), the number and variety of beautiful Lepidoptera at times fairly bewildering. *Chrysina macropus* that fine green Scarabæid with violet legs, found under electric lights in the Plaza and also seen flying in bright sunlight. Sept. 13. Mostly at Xico in the coffee district, reached by rail, and at the fine water-fall at Texolo. Near this last a swarm of several hundred whitish and yellow butterflies, observed to alight repeatedly on the same damp spot, of about one square foot in area, for at least two hours, proved to be composed of four species of *Terias* (*fabiola, tenella, proterpia, mexicana*) and a *Catopsilia.*

Sept. 14-18. Mexico City and vicinity.

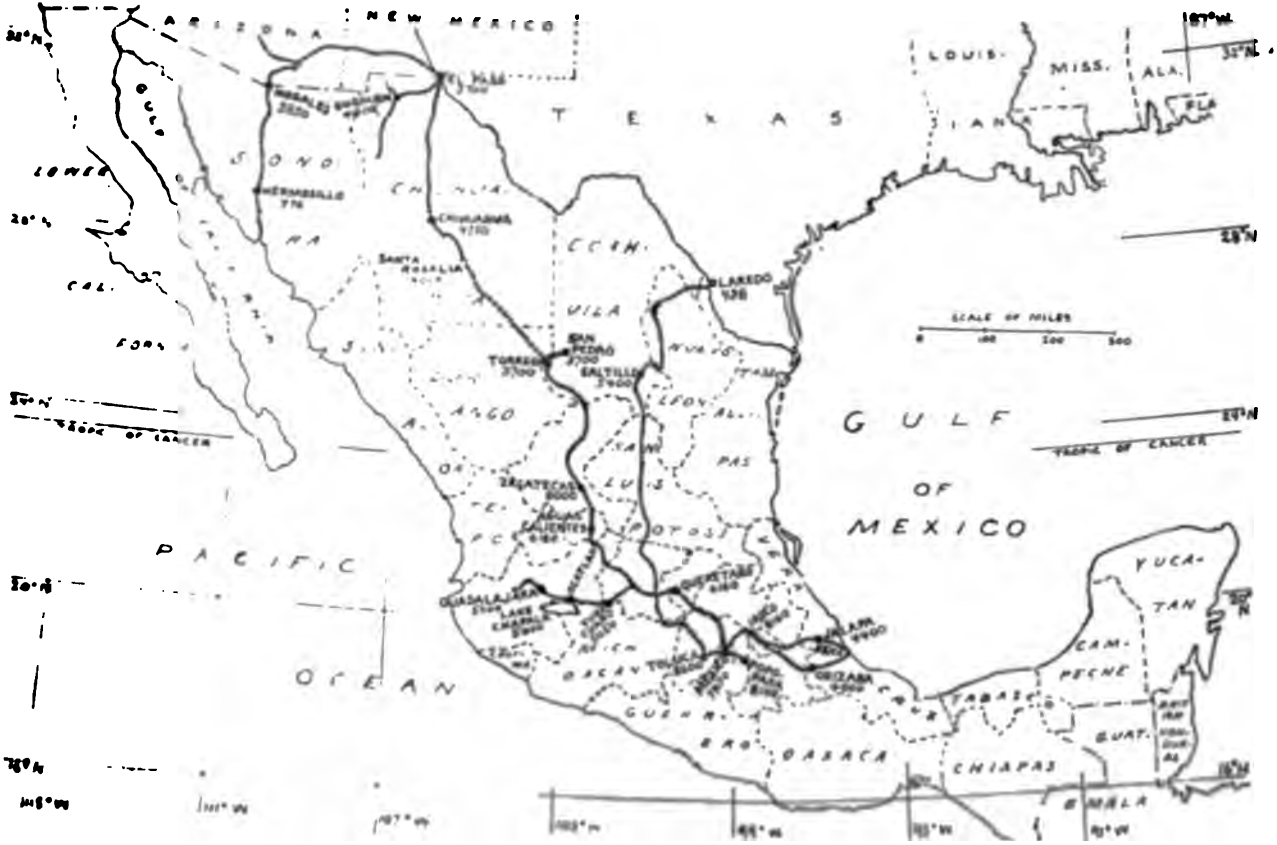
Sept. 17. Popocatepetl Park or Cedral (good but expensive English hotel), a short distance beyond Amecameca. Insects few; Odonata very rare, none taken. Fine views of Popocatepetl and Istaccihuatl on the way down, but peaks cloud-covered for hours in middle of day.

Sept. 18-20. Toluca (Hotel Andueza; there are several others), very clean city, beautiful scenery. Nevada de Toluca cloud-covered entire time of our stay. Walked to villages just north of city on Sept. 19, where a few (4) species of Odonata were fairly abundant around pools in the midst of fields of maguey and maize. Butterflies scarce, many humming-birds and lizards. The drainage of Toluca is conveyed by an open ditch to a field, several miles from the city, for subsidence and evaporation. Swifts abundant over this standing water, the only dragonfly here being *Ischnura denticollis* in grass along the water's edge.

Sept. 20, 21. En route to Saltillo.

Sept. 22. Collected in the morning at the Baños de San Lazaro y la Asuncion, on north edge of Saltillo, and in the afternoon near river, opposite the town, by pools along the railroad near the Panteon. The desert near at hand. Nine species of Odonata in all, a single *Enallagma semicirculare* beaten out of the grass at the latter locality. The dining room of the American-built Hotel Coahuila at which we stopped swarmed with *Blattella,* a few of which also invaded our sleeping room on the third floor.

Sept. 23. Left Mexico at Nuevo Laredo en route to Galveston, thence by steamship to New York.


ARIZONA
NEW MEXICO
TEXAS
LOUISIANA
MISS.
ALA.
FLA.
GULF OF MEXICO
PACIFIC OCEAN
GULF OF CALIFORNIA
LOWER CALIFORNIA
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
SAN LUIS POTOSI
ZACATECAS
DURANGO
SINALOA
VERA CRUZ
MICHOACAN
GUERRERO
OAXACA
TABASCO
CAMPECHE
YUCATAN
CHIAPAS
GUATEMALA
NOGALES 3820
HERMOSILLO 716
CHIHUAHUA 4710
SANTA ROSALIA
TORREON 3700
SAN PEDRO 3700
SALTILLO 5400
LAREDO 438
ZACATECAS 8000
AGUAS CALIENTES 6180
GUADALAJARA 5100
LAKE CHAPALA 5000
QUERETARO 6150
TOLUCA 8600
JALAPA 4900
ORIZABA 4200
SCALE OF MILES
0
100
200
300
TROPIC OF CANCER
32°N
28°N
24°N
20°N
16°N
115°W
111°W
107°W
103°W
99°W
95°W
91°W
87°W

In all 100 records for Odonata were obtained; 85 of these are new, *i. e.* all those from all localities at which any collecting was done excepting Queretaro, Jalapa and Xico. The 100 records represent 43 species, 31 species being taken or identified from the localities visited north of the twenty-first parallel of north latitude. This number does not indicate a very rich Odonate fauna for the northern Mexican plateau, although, no doubt, many additions are yet to be made to the list.

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The Male of Comperiella.

By L. O. Howard.

In *Entomological News* for April, 1906, pp. 121-122, under the heading "An Interesting New Genus and Species of Encyrtidæ," I described *Comperiella* gen. nov. *bifasciata* sp. nov. from one female specimen bred from *Aspidiotus* (*Aonidiella*) *aurantii* Maskell, collected in China by Mr. George Compere. Since that time, Mr. E. K. Carnes has bred the male in the insectary of the California State Horticultural Commission at Sacramento, California, and has sent me a single slide mount. It may be described briefly as follows:

COMPERIELLA Howard.

Male—Antennæ with short subcylindrical pedicel; funicle joint 1 twice as long as pedicel and about equal to 2; 3 and 4 longer and subequal in length; 5 of nearly the same length, and 6 somewhat shorter; club ovate, pointed and shorter than pedicel joints 5 and 6 together; entire flagellum, with whorls of long curved hairs. Abdomen shorter than thorax and flat above. Eyes well separated, naked.

Comperiella bifasciata Howard.

Male.—Length 1.1 m.; expanse 2.4 mm.; greatest width of fore wing .43 mm.—General color dark brown, nearly black; mesonotum with slight greenish metallic reflections; antennæ light brown, pedicel darker; tips of front and middle tibiæ lighter; tarsi yellowish except terminal joint. Wings perfectly hyaline, veins dark brown.

Described from 1 specimen. Habitat, China. Type in U. S. National Museum.

Notes on some little known North American Syrphidae.

By Paul R. Jones, Lincoln, Nebraska.

1. **Chrysogaster nigrovittata** Loew.

Two females, one from Craig's Mountain, and one from Moscow, Idaho. The antennæ are a trifle longer than I would infer from Loew's description, the epistoma rather prominent, upper part of the face with delicate transverse striæ, front rugose on the sides with a middle longitudinal space. Thorax finely punctate, deep green, with four coppery longitudinal stripes. Legs wholly black. Formerly recorded from Washington, California and Colorado.

2. **Chrysogaster stigmata** Williston

Three specimens; two from Craig's Mountain, and one from Moscow, Idaho.

3. **Pipiza albipilosa** Williston.

A female from Moscow, Idaho, and a male from Vollmer, Idaho, May 30, 1896. Compared with a female from Pennsylvania, the pile on the female is longer and a trifle lighter than in the eastern specimen; third joint of the antennæ wider, answering to Williston's description minutely; abdomen is wider, clothed with shorter pile, than in the one from Pennsylvania; also, with the posterior part of the second and third segments with dark appearing cross bands of black pile. Legs black, tibiæ and tarsi not so light as in the eastern specimen, being more brownish. Wings not so distinctly brownish and the outer anterior angle of the posterior cell a trifle more obtuse.

The male not so distinctly white pilose as the female. Front and vertex appearing black pilose, in some lights, and white in others; face with similarly colored pile. Third joint of the antennæ more like that in the eastern female and lighter than that of the western specimen. Thorax, with pile similar to that of female; abdomen similar to that of western female and with similarly colored pile. Legs black, similar to those of western female. Wings more brownish, similar to those of specimen from Pennsylvania, outer anterior angle of the first posterior cell also similar, being more acute than that of western female. Length 8 mm. In general appearance, the western specimens are larger and more thickly set. Formerly recorded from a female from Pennsylvania.

4. **Pipiza pistica** Williston.

A female from Pike's Peak, Col., July 20, 1906 (Prof. Bruner), which agrees in every way with Williston's description, except all four joints of the anterior and middle tarsi are blackish, the first one not so much so as the rest, the metatarsi are yellow. The specimen is shorter and more robust than I would infer from the description.

5. **Pipiza calcarata** Loew.

♂.—Bronze-black, white pilose, eyes greenish, pile white, in some reflections black, front black pilose, whitish in some lights, face white pilose appearing darker when viewed from below. Antennæ black, third joint reddish, broadly oblong, pile of thorax light colored. Pile of the abdomen very short, longer on the lateral border, white. Legs black, front tibiæ except a broad blackish ring, middle tibiæ less so, first joint of four anterior tarsi luteous, last three joints blackish. Hind coxæ with a long slender process, compressed toward the end. Wings except the extreme base cinereous, small cross vein from the base of the discal cell and last section of the fourth vein from the margin of the wing less remote than in *P. femoralis*, vein at outer end of discal cell straight, not bent as in *P. femoralis*, which is only slightly so.

Formerly recorded from New York and New Jersey.

6. **Pipiza pulchella** Williston.

One female from Lawrence, Kansas, and a male from Brookings, South Dakota, which agree with Williston's description, except the last three joints of the four anterior tarsi are black, the last of the hind tarsi, black; second, brownish. The face of the male is longer and more whitish pilose than the female. Formerly recorded from females from Connecticut, Massachusets, Florida, and New Jersey.

7. **Chilosia aldrichi** Hunter.

Two females from Pike's Peak, Col., July 22, 1906 (Prof. Bruner), which agree with Hunter's description. The third antennal joint is nearly black. Formerly recorded from Idaho.

8 **Chilosia cyanea** Hunter.

One female from Colfax, Washington, July 10, 1895, which agrees in every way with Hunter's description, except the wings are cinereous with the basal half tinged with brown. Formerly recorded from Moscow, Idaho.

9. **Chilosia occidentalis** Williston.

A male from Custer, South Dakota, which coincides with Williston's description. The wings are cinereous, with a streak of dark brown running obliquely through the center. Length 10 mm. Former records from Alaska and California.

10. **Chilosia laevis** Bigot.

♂.—Black, eyes bare, front and vertex long, black, pilose, face shining black, bare, deeply concave below the antennæ to tubercle which projects farther than the antennæ, then deeply concave to epistoma, lateral sutures extend to base of the antennæ. Antennæ very small and nearly black, arista more than twice as long as the antennæ, very finely pubescent. Thorax and scutellum shining black with a greenish tint, clothed with long black pile which shows lighter in some lights. Borders of the scutellum with a row of long black, bristly hairs. Abdomen ovate, first, fourth and fifth segments sub-shining, second and third, except anterior angles, opaque, clothed with a fine black pile and longer luteous pile which is quite long on the lateral margin of the segments. Halteres testaceous, squamæ blackish, black ciliate. Legs black, fringed with luteous pile, base of tibiæ somewhat luteous. Wings cinereous hyaline, upper and basal part tinged with light brown. Length, 8 mm.

One male from Pike's Peak, Col., July 20, 1900 (Prof. Bruner). Formerly recorded from a female from Washington, by Bigot. Bigot's description is rather short, but I believe this to be correctly determined.

11. **Melanostoma coerulescens** Williston.

One male from Moscow, Idaho. The tubercule is smaller, the lateral spots on the second segment of the abdomen are very faint and whitish, those on the third segment are very distinct and yellow, those on the fourth are nearly as faint as the spots on the second, and are also whitish. The remaining characters coincide with Williston's description. Formerly recorded from Colorado and Quebec.

12. **Sphegina infuscata** Loew.

One female from Moscow, Idaho. The pile on the dorsum of the thorax is very delicate and nearly obscure. Formerly recorded from Alaska, Oregon, Colorado and New Hampshire.

13. **Sphegina lobata** Loew.

A female from Moscow, Idaho. Front and face black, covered with fine white pubescence. Antennæ brownish. The abdomen has a bluish cast, the large testaceous spots on the third and fourth segments are wanting, the fifth segment does not have the appearance of sordid white. Legs whitish yellow, hind legs black; base of femora, band in middle of tibiæ yellowish; tarsi brownish yellow. Formerly recorded from Middle States, New Hampshire, Oregon, New Jersey, New York.

14. **Hammerschmidtia ferruginea** Fall.

Five males and one female from Pike's Peak, Col., July 20, 1906 (Prof. Bruner). The face is lighter than I would infer from the description. Formerly recorded from Washington and the Saskatchewan River.

15. **Volucella evecta** Walker.

Var. *facialis* Williston. Face reddish yellow in the middle and thickly clothed with yellow pile. The dorsum of the thorax with black pile. Pleura with long yellow pile. Formerly recorded from New England, Middle States, British Possessions, California, Alaska. A male from Pike's Peak, Col., July 20, 1906 (Prof. Bruner).

16. **Eristalis saxorum** Wiedeman.

Five females and four males from Pike's Peak, Col., July 22, 1906 (Prof. Bruner). The yellow spots on the second segment of the males are very distinct, nearly all of the opaque markings of the abdomen of the females are wanting. Formerly recorded from Georgia, Pennsylvania, Massachusetts, Connecticut, New Jersey.

17. **Xylota vecors** Osten Sacken.

Agrees with Osten Sacken's description, except the legs and coxæ are more of a fulvous, the hind tibiæ and apical fifth of hind femora black. Formerly recorded from White Mts., New Hampshire, and Montreal.

Cecidomyia acarivora n. sp.

By E. P. FELT, Albany, N. Y.

The above named species was received through the courtesy of Dr. L. O. Howard, of the Bureau of Entomology, U. S. Department of Agriculture, from Frederick Maskew, of Southern California, who found the larvæ feeding upon *Tetranychus mytilaspidis* and *T. sexmaculatus*, infesting lemon leaves and fruit at Chula Vista, California. At the request of Dr. Howard, we have decided to describe this species at once.

Male.—Length, 1.5 mm.—Antennæ longer than the body, probably pale yellowish, rather thickly haired; 14 segments, the first broadly obconic, the second flattened basally, subglobose, the third and fourth slightly fused, they and the following binodose, the enlargement subequal; three well-developed circumfili. Palpi apparently composed of five segments, face probably pale yellowish. Mesonotum apparently light brown. Scutellum and postscutellum concolorous. Abdomen a yellowish red. Wings hyaline, costa dark brown, subcosta uniting with the margin near the basal fourth, the third vein just beyond the apex, the fifth at the distal third, its branch at the basal third. Halteres probably pale yellowish. Legs presumably nearly uniform pale yellowish, anterior claws bidentate, the others simple. Genitalia; basal clasp segment long, slender, terminal clasp segment rather short, swollen at the base; dorsal plate short, broad, deeply and narrowly incised, the lobes broadly rounded distally and with several coarse setæ apically, ventral plate long, broad, somewhat excavated at the basal third, swollen near the distal third, roundly truncate distally and with several conspicuous setæ at the slightly notched lateral posterior angles.

Female.—Length, 1.75 mm. Antennæ extending to the fifth abdominal segment, apparently light yellowish, sparsely haired; 14 segments, the third and following with a smooth stem about ½ the length of the subcylindric basal enlargement. Palpi consisting of four segments. Ovipositor short, the lobes subtriangular, tapering to a narrowly rounded apex and thickly clothed with coarse setæ, colorational and other characters about as in the opposite sex.

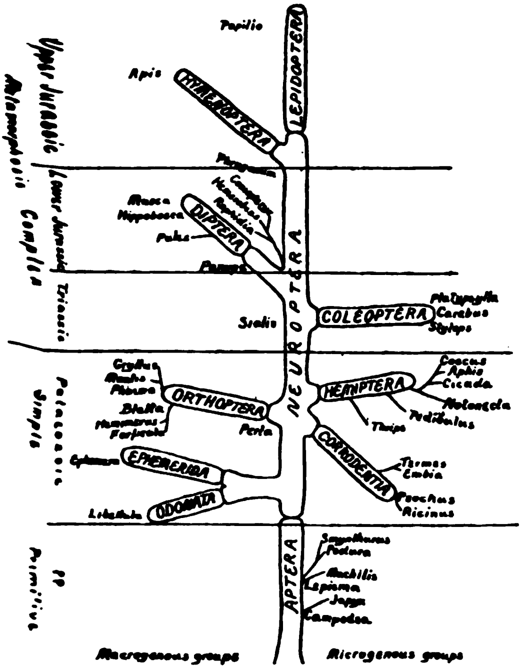
Larva.—Length, 1.75 mm., rather stout, tapering anteriorly to a rather conspicuous head and broadly rounded posteriorly. Head large, broadly rounded, with a pair of long, slender, cephalic horns at the lateral margins, mouth parts rather inconspicuous.

Types—Cecid 847 deposited in the U. S. National Museum and New York State Museum.

The Classification of Insects.

By C. W. Woodworth.

The numbers of orders of insects recognized by recent authors has varied from seven to thirty-four. The most diverse views are also held as to the relationships between these groups. So great are the differences that one would be led to believe, after a superficial review of the situation, that little or no progress has been made towards a generally acceptable classification. A more careful study will show, however, that the differences of opinion, though often radical, still lie in rather narrow limits. There are, for instance, only thirty-nine groups that have ever been raised to the rank of orders, or which have ever shifted their position from one order to another. The author's view of the relation of these groups to each other and their grouping into orders is shown in the following diagram, in which these thirty-nine groups are designated by names of typical genera.



The Aptera are generally conceded to occupy the place given to them in this diagram, and are always placed together, though some authors make six orders; some three, uniting them in pairs; others two, uniting the four lower groups; and still others only one, or a few uniting the whole series with the Neuroptera.

Campodea seems a natural transition from *Scolopen-*

drella, and *Lepisma* is generally looked upon as very near to th ancestor of all the higher insects.

Winged insects are usually conceded to have been derive from a single source, but recent authors have arranged then selves into two camps, according as they regard the origin insect to have been *Blatta*-like or *Perla*-like. The writ strongly inclines to the latter view. If the *Blatta*-like ancest was accepted, however, the only change necessary in the di gram would be the location of *Blatta* in the place of *Perla* an the removal of the latter up the main stem towards *Sialis*.

The Odonata and Ephemerida are usually recognized as di tinct orders by recent authors, though some would still uni them with the Neuroptera nearer to the *Perla*. The placing these two groups apart from all other winged insects is an ide originating with myself. The basis for this division is the fa that these ancient groups alone among insects existing since th paleozoic era have the form of articulation of the wing whic permits only a motion in one direction; all other groups posses ing structures permitting the wing to lie parallel with the ax of the body when at rest. This differentiation of thorax an wing structure must have occurred in very ancient time; shoul the importance of this specialization not be admitted, then thes groups would simply be moved closer to *Perla*.

The Orthoptera are almost uniformly combined into one o der as is here done with the exception of those who wou make a separate group for the Forficulids. The latter grou seems to have clearly been derived from a *Blattid* ancestor. Th idea that it might have come directly from such an insect a [illegible] is not, I think, held by any one at the present tim There seems to be nearly as much ground for making six orde as done by Handlirsch as for separating off this one. Acc ing to the conception here presented there are two groups large insects which left the water in the paleozoic era, o *Phasma*-like which lived on the foliage of plants and gave ris to the Mantids and the saltatorial forms, the other feeding decaying vegetation on the ground, the ancient cockroaches an the two derived groups represented by *Hemimerus* and [illegible] *cula*. Both of these groups remained near enough like the primitive ancestors to justify their retention in a single order or a closely allied group or orders as one may wish.

The Corrodentia, though sometimes united with the Neuroptera, are commonly separated into three or four orders as here indicated, though their close relationship is coming to be very generally accepted. The birdlice are most commonly segregated as an independent order. After the general rejection of the idea of the relationship of this group with the Pediculids it has gradually been coming to be recognized as a recent specialization of a nest-infesting wingless *Psocid*.

The relationships of the groups of sucking insects included here in the order Hemiptera will, I think, be generally accepted. The chief difference of opinion will be as to whether the groups represented by *Thrips* and *Pediculus* should not be made independent orders. Only a few would still further increase the list of orders as indicated by the groups shown at the end of this branch.

All the groups on the right hand side in this diagram are supposed to be microgenous, that is to have originated as small insects, the Corrodentia entering the same habitat as the ancient Blattids and the primitive Hemiptera taking the same locations as the *Phasma*-like forms, but leaving no early fossils because of their small size and delicate structures until after the groups became largely differentiated. The social white ants and the few highly developed palæozoic bugs with the sucking mouthparts already perfected are all the ancient remains of these groups, and in both cases they belong to groups which would not be counted most ancient on anatomical grounds. The venation in both the Corrodentia and the Hemiptera show a profound reorganization, best explained by their simplification due to small size and their reorganization when a successful specialization of the body made possible a regaining of considerable size, a specialization best accomplished in the Hemiptera.

Leaving the groups with simple metamorphoses which were differentiated in the paleozoic we find in the triassic, a *Sialis*-

like form, evidently with complex metamorphoses whose nearest allies in the former period were undoubtedly the *Perla*-like insects of that age.

The Coleoptera also are represented in these strata by the first undoubted fossils. The group has no allies among the ancient insects. The older idea that the Staphylinidæ were possibly derived from something like the Forficulids is based upon the most superficial observations and is now generally recognized as untenable. Beetles probably arose as small insects with the habits of the Corrodentia, but with the immense advantage of complex metamorphosis, making possible a better adaptation to their environments. The resemblance between beetle larvæ and those of the Sialidæ is the only positive evidence we have as to the phylogeny of this group and a rejection of this would simply leave the group isolated. The three groups which have been considered distinct orders are now uniformly united to form one order.

In the jurassic the remaining large groups of insects make their appearance, though none allied to *Papilio* or *Apis* appear before the middle of this era.

The Neuropterous groups are very commonly separated into distinct orders, probably because of the very evident leading of Panorpids and Phryganids toward the higher orders. The Neuroptera are maintained as one order in the scheme here presented, because of the author's conviction that the change from a *Perla* to a *Sialis* has not involved any such fundamental changes in structure as marked the differentiation of the beetle and that in becoming a *Panorpa* or a *Phryganea* there was nothing comparable to the formation of the groups of flies or wasps or moths. If, however, other views are held, the result would be simply the separation of this group into two, three, four, five, or more orders, having the relationships indicated on this diagram.

The Diptera have often been made into two groups by the separation of the fleas, and more rarely into three, and the Hymenoptera and Lepidoptera have always had the same value. The derivation of the Diptera from a Panorpid-like ancestor has not been generally accepted as yet, but no other origin has been suggested, except that it was Neuropterous. The same is true of the Hymenoptera which have often been placed nearer to the Diptera and with none or very vague ideas as to their origin. It seems to the author that the evidence of the wing venation in each of these three orders is unimpeachable as all recognize it is in the case of the Lepidoptera.

The scheme just presented illustrating the phylogeny and primary classification of insects, while not an elective or compromise measure in any particular, does express more nearly a consensus of the opinions of recent students of the subject than any thus far presented, and illustrates the fact that the most essential differences of opinion between authors is the same as in all other attempts at classification, the differences between those who contend for few or for many groups.

Ctenothrips, new Genus.

By H. J. Franklin, B. S., Massachusetts Agricultural
College, Amherst, Mass.

Head about as wide as long. Eyes prominent; vertex elevated between them. Ocelli present and large in size. Antennæ eight-segmented. Prothorax strongly rounded in outline, when viewed from above or below; two long spines at each posterior angle; no long spines at the anterior angles. Wings well developed, but very narrow for length; each one of the fore pair with two longitudinal, but not prominent, veins; these veins and the costa set with prominent spines. Surface of abdomen reticulated. Lateral portions of the posterior margin of eighth abdominal segment dentate and strongly produced posteriorly. Posterior margin of the dorsal plate of the eighth segment comblike (Fig. 2). Tenth segment split above; only moderately conical in form. Ovipositor well developed.

Generic name derived from (κτεις, comb: θριψ thrips):

This genus shows certain affinities with both *Euthrips* (of Hinds) and *Sericothrips* Haliday. The wings and antennæ are strongly suggestive of *Sericothrips*, but the abdomen lacks the numerous small spines characteristic of that genus.

Ctenothrips bridwelli n. sp.

Female.—Length 1.75 mm. to 1.9 mm.; width of mesothorax .33 mm to .37 mm.; greatest width of abdomen .45 mm. to .48 mm. General color very dark brown, thorax lighter.

Head a little longer than wide; equally broad in front and behind, somewhat retracted into the prothorax; sides immediately behind the eyes strongly concave; top and sides behind rough with transverse ridges. Eyes with rather unusually strong hairs between the facets, appearing to protrude strongly on account of the concavities behind them. Cheeks, behind these concavities, rather full and rough with ridges. On the hinder border of the postocular concavity, on each side, there are three prominent spines rather closely placed. Ocelli large and well separated, ocellar bristles present, but inconspicuous. Mouth cone rather long and sharp. Antennae about two and one quarter times as long as the head; their bases separated by the notched elevation of vertex; relative lengths of segments as follows:

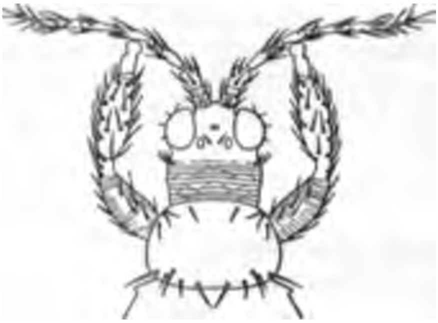


Fig. 1.—Head, prothorax, antennae and forelegs of female.

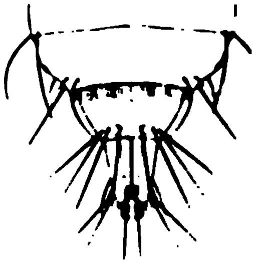


Fig. 2.—End of abdomen.

Number of segment.	1	2	3	4	5	6	7	8
Spaces of micrometer covering it.	9.5	11	20.5	17.5	14	10	3	5

Basal two segments much the thickest; spines on most of the segments long and slender, sense organs rather small and inconspicuous. Segment one cylindrical, somewhat thicker at base than at apex; two strongly constricted toward the base; three and four fusiform; five similar in form to four at its base, but quite broad at its apex and rather broadly joined to six, which with style tapers gradually to the tip. Color: one and two rather dark brown; three clear yellow; four yellow, also slightly tinged with brown; five yellow at base, but gradually shading into light brown at apex; six brown; style brown but lighter than six.

Prothorax but little more than three-fourths as long as the head; nearly one-third of its own width wider than the head; sides well rounded; angles rounded; surface smooth; two long spines at each posterior angle; no long spines at the anterior angles; besides the long spines at the angles, there are six shorter ones arranged in a transverse row near the posterior border, the two middle ones in the row being the longest; there are three short upcuvred spines at each of the anterior angles and a single spine near the anterior border on each side, about half way from the angle to the median line. Prothorax concolorous with pterothorax; much lighter than head and abdomen. Mesothorax more than one-fourth its own width broader than the prothorax; metathorax somewhat narrower than mesothorax; meso- and metathorax together slightly more than one and one-half times as long as the prothorax. Surface of mesoscutum strongly reticulate. Wings well developed; somewhat variable in length, usually reaching the anterior border of the seventh abdominal segment; very narrow and slender for length; fore wings only slightly longer than hind ones. Breadth of fore wings at middle only about one-twenty-first their length; the basal fourth of each transparent, the remainder being heavily shaded with brown, especially the middle portion. Two longitudinal, but not prominent veins extend to the tip of each fore wing; spines on the basal portion of the wing light, but on the shaded portion brown; spines on costa of good length and about twenty-five in number; on the fore vein from eighteen to twenty, placed at regular intervals for the most part, but with a considerable gap toward the base of the wing and often with irregular gaps toward the apex; on the hind vein there are from thirteen to fifteen spines also placed regularly for the most part, but usually at greater intervals toward the apex of the wing; the scale bears several spines; costal fringe of fore wings rather slight; posterior fringes moderately heavy and more or less crinkled; surface of wings thickly covered with minute spines. Legs (especially the middle and hind pairs) rather long and slender; quite strongly and evenly spinose, but otherwise unarmed except for a comb-like row of about twelve stronger spines on the

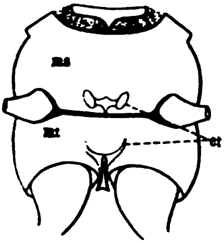


Fig. 3.—Ventral view of pterothorax; *et*, endo-thoracic invaginations; *ms*, mesosternum; *mt*, metasternum.

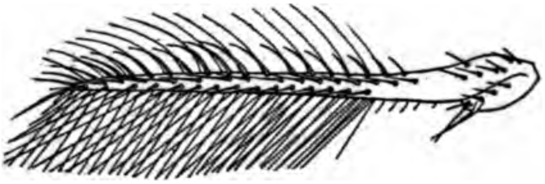


Fig. 4.—Left forewing.

inner side of each posterior tibia. Anterior legs somewhat shorte and stouter than the others. All the femora more or less roughene by encircling ridges; all the tibiæ constricted toward their bases tarsi long, as broad at their apices as at their bases; anterior an posterior, especially the posterior, coxæ thick and heavy. Genera color of legs dark brown; tibiæ generally slightly lighter than th femora; tarsi yellowish brown; the very bases of the middle femor and all of the middle trochanters light translucent yellow.

Abdomen at base considerably narrower than the pterothorax very elongate-ovate in general outline; widest at the fifth and sixt segments; from the posterior border of the seventh segment taperin rather abruptly to the base of the tenth segment; nearly three time as long as broad; surface, when viewed by reflected light, strongly an closely reticulated, both above and below; last two segments les strongly reticulate. Abdomen very dark brown; first segment sometimes lighter; apical portion of the ninth segment and all of the tent segment always somewhat lighter than the remainder. The sides o the eighth segment sharply dentate with rather coarse teeth on th hind border and strongly produced posteriorly; the posterior margi of the eighth dorsal segment drawn out in such a way as to forn comb-like teeth. Spines along sides and around tip of abdome mostly long, large and conspicuous; those on the ninth segment a a rule larger and heavier than those on the tenth; those at the ver apical margin of the tenth small and inconspicuous. Protruding fro the apex of segment ten is a peculiar small globular semitransparen organ which is tinged across the middle with brown and bears tw small inconspicuous spines. This organ is probably a part of th sheath for the reception of the ovipositor when it is not in use. Attached to each side of the ventral apical margin of the tenth segmen is a peculiar flap like process. These processes are present in othe species and are often found, in mounted specimens, strongly incline toward each other, over and beyond the ventral gap in segment te and it may be their function to assist as catches in holding the ovipositor in place. Both the globular organ and the flaps here describe are present, and under the high powers of the microscope appea prominently, in all the specimens which I have.

Described from five cotypes, two of which are deposited : the collection of the United States National Museum, an the remaining three in the collection of the Massachusett Agricultural College.

Specimens captured in Bellamy River Swamps, Dover, N H., on flowers of *Symplocarpus foetidus* Salisb., April 1 1904, by Mr. J. C. Bridwell, through whose kindness I received them and for whom I name the species.

A Noctuid new to the North American Fauna.

By Henry Engel, Merrick Museum, New Brighton, Pa.

While examining the collection of Mr. George Krautwurm, of Pittsburgh, Pa., during the winter of 1904, I observed a Noctuid of striking appearance, and a total stranger to me.

Among other species, Mr. Krautwurm kindly loaned me this specimen, and I sent it to Prof. J. B. Smith, who remarked that it was a puzzle to him.

The specimen was next sent to Dr. H. G. Dyar, who informed me that the species was not represented in the North American collection of the U. S. Natl. Museum. He suggested that I return the specimen the following winter for comparison with the Schaus collection, which at that time was not in shape for comparison. I purchased the specimen from Mr. Krautwurm, and during the following winter sent it again to Dr. Dyar, who made the following determination, and I hereby extend my thanks to him for his kindness in giving me the references, as well as determining many other species for me.

Massala, Walker. Cat. British Museum, XXXIII, 977, 1865.
obvertens Walker.
Aseta obvertens, Walker. Cat. British Museum, XV, 1580, 1858.

Habitat.—West Indies, tropical America to Mexico; Pittsburgh, Pa., August 3, 1904. One specimen found at rest on trunk of willow tree. (Geo. Krautwurm.)

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Dr. F. E. Blaisdell, 1632 Post Street, San Francisco, California, will determine the Tenebrionidæ of the United States for those persons desiring names.

Mrs. A. T. Slosson is spending some weeks at the Mountain Park Hotel, Hot Springs, North Carolina.

Names of Coleoptera.—In the News, November, 1906, p. 349, I stated, on Dr. Bergroth's authority, that *Ino* (preoccupied) should be called *Inoplectus* Smith. Dr. Bergroth now writes to say that this was a slip of the pen for *Inopeplus*.

Leptotheca Fauvel, 1904, for a genus of Ptinidæ from New Caledonia, is preoccupied by *Leptotheca* Thelohan, 1895, in Protozoa.—T. D. A. Cockerell.

A new genus and two new species of Geometridae.

By JOHN A. GROSSBECK.

EUPHENOLIA n. gen.

Palpi rather short, projecting a little in front of head, ascending, long scaled; front smooth, rounded; tongue well developed; antennæ filiform ciliate below, scaled above, the scales giving the appearance of serrations; thorax and abdomen smooth scaled; hind tibia of male slender, no spurs, without hair pencil; tarsi well developed, long slender. Fore wings 12 veins, one accessory cell; R_1, R_2 and R_3 (=veins 11, 10 and 9, respectively), off R_4 (=8), R_4 shortly stalked with R_5 (=7), M_1 (=6) widely separate. Hind wings 8 veins. Sc. (=8) anastomosing with R (=7) on second quarter of cell, R very long stemmed with M_1.

Type—*Euphenolia skinnerata*, n. sp.

A genus of the Sterrhinæ differing from all others in the long, slender posterior legs, which are destitute of spurs and hair pencil.

Euphenolia skinnerata n. sp.

Expanse 13.5-14.5 mm. Front umber brown, vertex creamy white, antennæ and palpi pale yellowish-brown; thorax and abdomen creamy yellow with a pale brown cast, more pronounced on the thorax. Wings creamy yellow; fringe concolorous. Primaries with intradiscal brown line one-fourth from base, bends suddenly out from costa, then evenly almost without curve to inner margin. A similar colored extradiscal line begins on costa one third in from apex, bends gently out and in to M_2, then again more strongly out and in to Cu_2 and shortly outward to inner margin. Basal area rather thickly dusted with brown scales. Median area with a central shade forming an indistinct brown line. No discal spot. Outer area with a broad shade of brown just exterior to extradiscal line; marginal line dark brown. Secondaries with two sinuous pale brown lines from costa to inner margin, the outermost area slightly brown shaded. Beneath with ornamentation of upper side largely reproduced, the inner lines rather inconspicuous; a small discal spot on all wings.

A well marked form very unlike any Geometer known to me.

Types.—One male, Rutgers College; one female, Academy Natural Sciences, Philadelphia.

Habitat.—Carr Canyon, Huachuca Mountains, Cochise County, Arizona, in August. Collected by Dr. Henry Skinner to whom the species is respectfully dedicated.

Sciagraphia decorata n. sp.

Expanse 27 mm.—General color even sordid gray with a delicate pink cast to the wings. Primaries with small black flecks on basal half of costa. Intradiscal line almost straight, scarcely discernible at costa, becoming very evident at cubitus, whence it proceeds as a distinct black line to inner margin, edged on both sides by a pink shade, more pronounced externally. Extradiscal line begins on costa a little over one-fourth in on costa, extends with a decided inward curve toward outer margin to M1, then bends at right angles and with a double inward curve ends at inner margin midway between the intradiscal line and anal angle. Internally, from angle to inner margin, this line is bordered by a deep shade of pink and externally by a very narrow border of the same color. Basal area uniform in color. Median area paler than rest of wing, with a somewhat diffuse discal spot, the pink showing rather plainly along the veins. Inner half of outer area deeply brown shaded;, the terminal line indicated by intervenular black dots. Secondaries more heavily shaded at outer margin and anal angle. A brown transverse line bordered on each side with pink is indicated on inner margin; discal spot rather faint; terminal line broken at the veins. Beneath, almost uniform sordid gray slightly shaded outwardly; discal spots and terminal line more distinct than above.

The above describes the female type: a co-type is a little worn, and while showing scarcely any pink, has the transverse markings more sharply defined at the costa, and a third line is present, indistinctly running through the median area rounding the discal spot externally.

Types—Two females, one at Rutgers College and one in Acad. Natl. Sci., Philada., from Dr. Skinner.

Habitat—Stockton, Utah, June 14th and July 1st.

Nearest to *snoviata* Pack., but quite different in the ground color, which in *decorata* is distinctly gray, not brownish, as are all the specimens of *snoviata* before me. The transverse lines are also very narrow, as compared with *snoviata*, and the angle of intradiscal line at M_1 is more acute, though this latter may be a variable feature.

I am prepared, with the assistance of Mr. Aug. Busck in the *Tineina*, to name any Lepidoptera, especially North American Phycitinae and Mexican moths.—Harrison G. Dyar, *U. S. National Museum, Washington, D. C.*

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1907.

AT a recent meeting of a profoundly learned society, papers were read in relation to the historical facts of Jonah and the whale, the seat of the soul (in the liver), and others of vast importance to humanity. This has suggested to us that we are very ignorant in relation to some entomological problems never satisfactorily answered. It appears very foolish to bother with the questions of economic entomology and the transmission of disease by insects to human beings, when we know so little about the conditions of the insect world when Noah landed on Mt. Ararat. About 300,000 insects have been described and the number of existing species has been estimated as high as 10,000,000. The questions we would propound are the following, and we trust they will be answered before less important matters are considered: How many species of insects existed at the time of the Flood? How did Noah catch a pair of each species? This question involves most important matters in regard to modern entomological technic. We can understand how the phytophagous insects were nourished, but if we knew how the vast army of parasites was treated it would be of value to the students of life-histories of to-day. Unfortunately the insects were kept alive; had they been dead, Noah's practice would have shed light on up-to-date museum methods. These studies have been greatly neglected and their importance grossly underestimated, and we can only hope that the Entomological Society of America will take up the matter at its next meeting and appoint a strong committee to look into the problem.*

* [illegible] are not important in this connection and need not be seriously [illegible]

Entomological Literature.

TRANSACTIONS OF THE AMERICAN ENTOMOLOGICAL SOCIETY: Vol. xxxii, Nos. 3 and 4 [received at Boulder, Colo., February 11, 1907; separates published earlier].

The new part of the Transactions, though not especially bulky, includes eight titles; three by Schaeffer, on Coleoptera; one by E. T. Cresson, Jr., on Diptera; one by Kellogg, on Mallophaga; two by Cameron, on wasps, and a list of the bees of New Mexico, by Cockerell.

Mr. Chas. Schaeffer treats of Scarabæidæ, Pselaphidæ, and Anthribidæ. The genera allied to *Bolboceras* are revised, with one new genus, a new species and subspecies, and some generic transfers. The result is as follows— if we use the recently published *Bradycinetulus* in place of the preoccupied term *Bradycinetus*.

Bradycinetulus Ckll.
  fossatus (Hald.)
  ferrugineus (Beauv.)
  serratus (Lec.)
  serratus peninsularis (Schaeff.)
  carinatus (Schaeff.)
Bolboceras Kirby.
  lazarus (Oliv.)
  hornii (Riv.)
  minor (Linell.)
Bolbocerosoma Schaeff.
  farctum (Fab.)

There is a new *Copris* from Arizona, with a table of the species of that genus; three new *Lachnosterna* species are described; and a new genus (*Anoplocephalus*) is proposed for a new species from Arizona, evidently a fine large form, very distinct from anything else in our fauna.

In the Pselaphidæ six new species are described, from North Carolina, Texas, New Mexico and California. The new Anthribidæ include sixteen species, with two new genera. The largest is *Phoenicobiella schwarzii* (*Phoenicobius schwarzii*), found by Townsend, at Brownsville, infesting *Sabal mexicana*.

Mr. E. T. Cresson, Jr., has a very interesting account of the Ortalidæ, collected by Messrs. Viereck and Rehn, during their expedition to New Mexico in 1902, including also some Mexican material obtained by Mr. J. F. McClendon, in 1903. There is a new genus (*Hiatus*), and new species of *Antomola, Pterocalla, Acrosticta* and *Euxesta*. The paper is accompanied by a plate.

Professor Kellogg lists the bird-lice collected by Mr. Rollo Beck at the Galapagos and Revillagigedo Islands, and neighboring waters, in 1901. The list is a long one, and two new species are described—

one after Dr. Ridgway, the other after Mr. Beck. The word *galapagoensis* is printed many times "*galapagœnsis*," which is quite erroneous.

Mr. P. Cameron describes numerous species of *Odynerus* and immediately allied genera from North America. Many are said to be from New Mexico, no collector's name being given. Presumably, they come from that mysterious "New Mexico" collection which contained so many evidently Mexican species, and we must regard the locality as doubtful until they are rediscovered. *O. ruficandis*, on p. 328, is a misprint for *ruficaudis*.—T. D. A. C.

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Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DR. W. G. DIETZ, 21 N. Vine St., Hazelton, Penna., will name Micro-lepidoptera, particularly *Tineina*.

Dr. Edwin C. Van Dyke will leave about May first on a four months' exploring trip to the Aleutian Islands, and says, "We are to make as thorough an exploration as we can, in the time, of the entire Aleutian group of islands. We will not stop at any point on the mainland after leaving Seattle, though we may possibly visit one or two of the Commander group. We go first to Unalaska, then strike west to Attu, and work back with the trade winds from there. We will thus not be at all in touch with the rest of the world. I go both as physician and scientist, the opportunity to thoroughly explore the group, being really too tempting for me to refuse. The party is to be known as the "Technology Expedition," and is mainly to make a thorough reconnoissance of the group. The party will be small, [illegible] including two assistants from the Boston Technology, so we will have to distribute our energies somewhat. I will have to do some botanical work in which I will have an assistant, but I can assure you, most of my time will be put in in collecting insects. I will try and collect as complete a series as I can in all orders from all of the islands. That I think is very much needed, and will enable us to get a very much better idea than we have had of the range of the various species. The insects are to be my own, but I will most likely send on a complimentary series to Cambridge, seeing that it is the Boston people who are financing it. I will, however, try and get series enough so that I can send somethings to my friends. All insects outside of Coleoptera, I will of course, ask others to work up, a full series, types included, to be returned to the California Academy. I will do the best I can with the Lepidoptera."

One of the most important entomological papers of many years past, from the standpoint of the student of variation, of heredity, or of evolution, has recently been issued by the Carnegie Institution of Washington, as Publication No. 48. It is entitled "An Investigation of Evolution in Chrysomelid beetles of the genus Leptinotarsa," by William Lawrence Tower, Instructor in Embryology, University of Chicago, and Associate, Station for Experimental Evolution at Cold Spring Harbor, New York. Pp. X, 320. Thirty plates, some in colors, 31 text figures, 107 variation tables in the text.

A SPECIAL MEETING of the Entomological Society of America will be held in Boston about the 19th of August next, in connection with the Seventh International Congress of Zoology. Members are urged to be present and to contribute to the program of the meeting.

In order to facilitate the work of the Executive Committee in arranging a program, abstracts of proposed communications should be mailed to the Secretary, J. CHESTER BRADLEY, Secretary-Treasurer, Berkeley, Calif.

Note that after July 15th the address of the Secretary-Treasurer will be Cornell University, Ithaca, N. Y.

Doings of Societies.

Minutes of meetings of the Brooklyn Entomological Society, 5 Stuyvesant Avenue, Brooklyn, N. Y., December 7th, 1906. resident Dr. Zabriskie in the chair and fifteen members presnt. Messrs. Robert P. Dow, of Brooklyn, and H. H. Brehme, f Newark, N. J., were elected members.

Mr. Dickerson spoke on "Causes of Periodical Increase and ecrease of Insects." Mentioning the enormous increase, posible under favorable conditions in some species, such as e San José scale and housefly, his remarks related chiefly to e occurrence and condition during a number of years of the llowing insects: rose-chafer, chinch-bug, cottony maple nd cushion scales, army and canker worms and brown-tail and ipsy moths. As factors causing a decrease he quoted: climtic conditions, insect epidemics, the interference by man, edacious insects and animals, fungus growths and parasites.

Mr. Doll stated that from a lot of cocoons of *Agapema galina*, collected at Brownsville, Texas, in the summer of 1903, oths had emerged during that year and during every suceeding year until the present time, when several pupæ still remain alive, this showing a pupal period of over four years, which is unusual in the saturniid moths.

JANUARY 17, 1907.—The President, Dr. Zabriskie, in the chair, and thirteen members present.

Mr. Edward Moore, of Brooklyn, was elected a member. The following officers were elected: President, Dr. J. L. Zabriskie; Vice-President, E. L. Graef, Corresponding Secretary, A. C. Weeks; Recording Secretary, George P. Engelhardt Treasurer, C. H. Roberts, Curator, Geo. Franck, Librarian, J. J. Levinson.

Prof. J. B. Smith was elected as delegate to the council of the New York Academy of Sciences.

FEBRUARY 7, 1907.—The President Dr. Zabriskie in the chair, and seventeen members and twelve visitors present.

Mr. Engelhardt addressed the Society on "Experiences in Collecting Along the St. Lawrence and Saguenay Rivers," illustrated with lantern slides and three boxes of various insects; the subject relating to a vacation trip made during the past summer to those regions.

In his remarks, he called attention to Niagara Glen on the Canadian side of the Niagara River gorge, a place which, though sadly neglected by travellers, is exceedingly beautiful and affords a good opportunity for collecting, as the vegetation is exceptionally rich. He further spoke of his visits to Toronto, the Thousand Islands, Montreal, Ottawa, Quebec, the Saguenay River and Tadousac, a small village at the junction of the Saguenay and St. Lawrence, where a two weeks' stop had been made. He described the topography and the pursuits and primitive life of the French inhabitants of that region. Insects were fairly abundant and especially interesting, as showing a faunal similarity with the sub-alpine region of the White Mountains, N. H. The following species were among those exhibited: Lepidoptera: *Argynnis chariclea*, *Grapta gracilis*, *Lycaena couperi*, *Hyphoraia parthenos*, *Notodonta simplaria*, *Habrosyne rectangula*, *Catocala briseis*, *Albuna pyramidalis*, *Sthenopis quadriguttatus*. Coleoptera: *Cicindela tranquebarica* var. *obliquata*, *C. longilabris*, *Dytiscus harrisii*, *Dichelonycha canadensis*, *subvittata*, *albicollis*, *Serica tristis*, *Xylotrechus* *quadrimaculatus, Saperda imitans.* Among other orders Hymenoptera and Odonata were well represented.

Returning East, Mr. Engelhardt visited the White Mountains in N. H., where, on top of Mount Washington, he found aquatic insects very abundant in numerous small pools.

GEO. P. ENGELHARDT, *Rec. Secretary.*

The 22nd regular quarterly meeting of the Pacific Coast Entomological Society was held on November 25th, 1906, at the residence of Miss Julia D. E. Wright in Palo Alto. President Fuchs in the chair.

Prof. Vernon L. Kellogg gave a talk on the life history of the Blepharoceridæ.

Mr. J. C. Bradley gave a talk on the Entomological Society of America, urging the entomologists of the Pacific Coast to join the society.

Mr. Coolidge spoke on the distribution of *Colias alexandra* and *edwardsii,* the former being found in Eastern Oregon, the latter in Eastern Cascade Mountains, both occurring in the Coeur d'Alene Mountains.

Dr. Van Dyke exhibited a new *Hetaerius* from California. He made a few remarks upon the species of *Necrophorus* found in the vicinity of San Francisco.. He spoke about the two common black ones: *guttula* and *pustulatus* var. *nigritus;* also of three maculate forms, *guttula* var. *hecate, vespilloides* and *marginata,* which he had found here. *H. pustulatus* var. *melsheimeri* was credited to the State but he had never seen any specimens from it and doubted whether it would be found west of the Sierras. The various species of *Hetaerius* were spoken of, the fact that though messmates with ants, very little was known about their true habits, a field of investigation which was in great need of being exploited. Their distribution was discussed and the opinion ventured that our Coast belt would no doubt yield many new species of the same as well as other small and markedly specialized species, when it was thoroughly worked over. The main reason given for this belief was that our Coast belt was the largest belt of territory in this country that had gained many species from the North, that had been little affected by the ice of the ice age. This in most other parts of the Northern part of our country had almost entirely wiped out of existence, the more lowly and the more highly specialized insects.

The 23rd regular quarterly meeting of the Pacific Coast Entomological Society was held on February 23rd, 1907, at the residence of Dr. F. E. Blaisdell, 1632 Post Street. President Fuchs in the chair.

Mr. J. C Bradley was elected to membership.

Mr. F. X. Williams gave an interesting account of his work on the Galapagos Islands (Expedition of the Cali. Acad. Sci.). He stated that five species of butterflies were observed there. *Pyrameis huntera* common, *Agraulis vanillae* var.; Sphingidae 5 species; Noctuids and Micros were well represented; Diptera rare, especially found on cactus; mosquitoes were abundant, and apparently where there was no water. They probably breed in the orchids which are abundant in the green belt. Chiggoes [illegible] common and attacked the feet; Orthoptera plentiful, 3 genera; cockroaches common; Hemiptera few, under stones and bark; some observed feeding on caterpillars; Coleoptera, 150 species one nocturnal species of *Cincindela; Calosoma* plentiful; Dytiscidæ, 5 species; Gyrinidæ, 1 species, Hydrophilidæ, 1 species, few Staphylinids were found on rotting catcus and carrion. Coccinellidæ, 3 species; Dermestidæ were common; Histeridæ not common; Elateridæ, 5 species; Buprestidæ, one small species; Cleridæ, 1 species; several Ptinides, Scarabæidæ, 2 species one a *Trox*, Cerambycidæ, 10 species, Chrysomelidae, 2 small species; Tenebrionidae were common Rhynchophora numerous. He also stated that 400 to 500 feet elevation was the best altitude for collecting. Turning over stones and logs yielded the best results Beating was of but little success, collecting at light gave fair results, especially at the beach His experience with black steel pins was very discouraging as they oxidize rapidly and soon become unsightly Brass pins were the best Capsules were bad on account of the dampness. Coleoptera were abundant in the cereals—especially on the vessel.

Dr. Van Dyke explained the object of the expedition—that it was to obtain all of the species possible before the natural conditions become changed by settlement of the islands; cattle, dogs and pigs have already been introduced and fire may start and destroy the fauna.

Darwin did the first collecting here and was followed by others. The present expedition was the most successful. Only 30 to 40 species were heretofore known, and Mr. Williams took ver 150 species and in large series. The collections are of value o determine the age of the islands. It has been thought that he fauna had been carried there by wind, birds and currents nd that the Islands were of volcanic origin. The Islands are robably the result of subsidence and the flora and fauna reuced thereby in the opinion of the doctor.

Mr. F. W. Nunenmacher gave an interesting account of his llecting in the vicinity of Nogales, Arizona. He is especially terested in the Cicindelidæ, and took 17 genera, 49 species; nd 2,000 specimens. The following is his list of species: *egilla maculata*, *M. vittigera*, *Hippodamia convergens*, *Coccella pauciscana*, *C. sanguinea*, *C. abdominalis*, *Harmonia cyoptera*, *Psyllobora* n. sp., *Chilocorus bivulneratus*, *C. cacti ochomus pilatti*, *Ex. bipustulatus*, *Brachycantha*, 2 species; *yperaspis*, a species close to 4-*vittatus*; *H. lateralis*, *H. 8-nota*, *H. pinguis*, *H. medialis*, *H. globula*, *H. pleuralis*, *H. fimolata*, *H. montanica*, and 4 species undetermined; *Hyperasdius*, 2 species; *Cephaloscymnus occidentalis*, *Smilia marata*, *Scymnillus aterrimus*, *Scymnus*, 14 species; *Thalassa ontezuma*, *Epilachna corrupta*, Novius n. sp.

Mr. J. C. Bradley discussed his studies on the Evaniidæ.

Mr. L. E. Ricksecker exhibited *Orgyia* in all stages of delopment.

Miss Julia D. E. Wright reported the progress of the Santa ara Valley Entomological Club.

Mr. F. W. Nunenmacher exhibited a fine series of Coccinelliæ from Nogales, Ariz.

F. E. BLAISDELL, M. D., *Secretary*.

On Friday, April 12, 1907, at the home of Erval Newcomer, Forrest Court, Palo Alto, was held the regular meeting of the Santa Clara Valley Entomological Club. In the absence of the president and vice-president, the meeting was called to order by C. F. Palmer, twenty members being present.

The club was much honored with the presence of D. L. Van Dine, experiment station entomologist for the Hawaiian Islands. He mentioned a number of entomological problems.

One of the most interesting of these is in regard to the honey produced on the islands. There is some substance there that the bees obtain that gives a very high percentage of glucose in the honey. The government pure-food law allows only a certain percentage of glucose, as that substance is one of the chief adulterants that is commonly used. While the island honey is pure and just as wholesome as that produced in any part of the world, this comparatively large amount of glucose shows badly in the analysis. The honey shipment of the islands will amount to over 800 tons this year, and the producers are greatly interested in having the law so modified in their case as to allow the honey to come under the pure-food products.

Another problem that the entomologist has to contend with is a small fly that in some parts of the islands is almost driving out the cattle industry. This fly has been abundant for a number of years, but it has only been of late that it has seriously threatened the interests of the cattle men.

Mr. Van Dine brought greetings from the Hawaiian Entomological Society to the local club, which he hopes to visit again on his return to the islands in about two months. Another guest of the club was Mr. Edward M. Ehrhorn, the state horticulturist, who spoke a few words on the work of the quarantine department of San Francisco. He also called attention to the parasite of the red scale recently imported from China.

Harvey Hall, instructor in botany at the University of California, gave a talk on the "Life Zones of California." Nearly every one can distinguish generally the life zones as desert, foothills, the timber and perpetual snowlines. About twenty years ago Dr. C. Hart Merriam was the first to map out the life zones accurately. Before this they were

ı as belts. The life zones are divided into the following:
: sub-tropical comprising a small portion of the Colorado
the Lower Sonoran, the desert area, characterized, by
eosote bush, tree yuccas, cactii and sand bur; the Upper
an, or chaparral zone characterized by ceonothus, man-
and different scrub oaks; transition zone or yellow pine
In this zone there are two centres of origin, the northern
ıuthern. The mixing of these two origins determined the
of this zone. Above this is the timber belt. Mr. Hall
ers this as one zone, but Dr. Merriman subdivides it into
udsonian and Canadian zones. Alpine hemlock, white
ıine, little sugar pine are found here. The Alpine zone
:terized by Alpine sorrel.

zones can be mapped out, but the reason and cause of
nes have yet to be determined.

J. S. Hunter, who has charge of the mosquito extermina-
ork at San Mateo and Burlingame, then gave an outline
work that has been done. He dwelt at length on the
:ance of the mosquito problem. The work of extemina-
ıe mosquito was first undertaken about four or five years
San Rafael, under the direction of Mr. Ashman. About
ears ago the Burlingame Country Club asked for help in
osquito problem, as they were exceedingly troublesome.
vo species that are most troublesome are the salt water
the *Culex lattivittatus* and *Culex squamiger*. These are
lifficult to control than the fresh water forms on account
great extent of the marshy land and direction of the
from South San Francisco. In conclusion Mr. Hunter
ıe work is still in continuance and it is hoped that this
in time may be fully freed of these insects.

Ehrhorn and Mr. Van Dine were unanimously elected
ers of the club.

ournment and refreshments followed.

JULIA D. E. WRIGHT, *Secretary*.

regular meeting of the Santa Clara Valley Entomological
was held last Friday night, March 8th, at the Delta
n House, Stanford University.

In the absence of the president, R. W. Doane, the vice-president, Earl Morris, the county entomologist, presided. Twenty-three members were present and three visitors.

J. Chester Bradley, instructor in entomology at the University of California, was the speaker for the evening. The general subject was the wing venation of the parasitic hymenoptera.

JULIA D. E. WRIGHT, *Secretary*.

The monthly meeting of the Newark Entomological Society was held in Turn Hall, Newark, on February 10, 1907, the President in the chair, and twenty members present. Mr. John Kuenzler, of Paterson, a visitor. Mr. Emile Gerstenborn, of New York, was proposed for membership and unanimously elected. Mr. Brehme presented "Notes on certain Rhopalocera species observed during the season of 1906." He spoke of the scarcity of *Chrysophanus hypophlaeus*, *Lycaena pseudargiolus* and its varieties, and *Thecla damon;* this latter a usually common insect at Paterson. *Thecla augustus* and *edwardsii*, he found very common locally: the former had always been rare with him and the latter he had never taken before. In 1906 he took over two hundred specimens, July 4, at Newark. He reported the capture of *T. m-album* on the Orange Mountains, April 28th. *Ceratomia catalpae*, Mr. Brehme stated, had made its way north as far as Irvington and Eagle Rock. Mr. Dickerson remarked that he had found it at Morristown and Hackettstown during the past season. Mr. Brehme also presented a paper on "How to prepare Lepidoptera for the Cabinet in Short Order."

Mr. Wormsbacher approved of the method as explained by Mr. Brehme, having himself practised it for some time; but he warned against the use of pine boards, relating an instance where all his specimens were glued fast to the boards owing to the exudation of the resin. Mr. Wasmuth exhibited a box of Lepidoptera, among which were *Catocala electilis*, *C. insolabilis* with a large white spot on the primaries, *C. unijuga* with yellow underwings, *Smerinthus saliceti* from Arizona and a rare indetermined species of *Gloveria* from Texas.

Mr. Gerstenborn showed a series of about sixty hybrids procured by mating a male *Paonias ocellatus* of Europe with a female *Paonias excaecatus.* Enlarged photographs of the hybrid larvæ were shown which in markings inclined toward the European species.

Mr. Brehme exhibited his collection of *Theclas,* representing forty-seven species exclusive of varieties.

Mr. Engleman showed a box of *Haploa* largely illustrating local forms, and Mr. Buchholz showed a fine series of *Euxoa ochrogaster* illustrating the exceedingly wide range of variation displayed by the species.

JOHN A. GROSSBECK, *Sec'y.*

The monthly meeting of the Newark Entomological Society was held in Turn Hall, Newark, on March 10th, the President in the chair, and fourteen members present. Messrs. George Domidion, of Jersey City, and J. Mattes, of New York, present as visitors.

Mr. Brehme showed his collection of *Lycaena,* consisting of forty-eight species and varieties. Mr. Mattes exhibited over two hundred beautifully blown larvæ of Lepidoptera which retained their natural colors to a remarkable degree. Mr. Engelhardt gave an account of his trip to Canada and spoke of successfully bringing *Lycaena couperii* to maturity from larvæ which he found on wild pea at Saginaw River in the Province of Quebec.

OTTO BUCHHOLZ, *Sec'y,* pro tem.

A meeting of the Entomological Section of The Academy of Natural Sciences of Philadelphia was held December 27, 1906. Mr. Philip Laurent, Director, presiding. Thirteen persons were present. The annual reports of the officers were read.

Mr. E. Daecke exhibited a *Bombus,* which on examination by H. J. Franklin proved to be B. *scutellaris* ♂. It was taken at Lucaston, New Jersey, September 17, 1903. This is the most northern point it has been found, and it is new to New Jersey.

Mr. Laurent said *Tenodera sinensis* was holding its own in Germantown, as he had found many eggs masses this season.

Dr. Skinner exhibited specimens of *Hemileuca electra* Wright.

The following were elected officers to serve for the coming year: Director, Philip Laurent; Vice-Director, H. W. Wenzel; Treasurer, E. T. Cresson; Conservator, Henry Skinner; Secretary, J. H. Ridings; Recorder, Henry Skinner; Publication Committee, J. H. Ridings, E. T. Cresson.

HENRY SKINNER, *Recorder.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held January 24, 1907. In the absence of the Director, Dr. P. P. Calvert was called on to preside. Seven persons were present.

Dr. Skinner exhibited chrysalids of *Anthocharis olympia*, presented by Prof. Charles A. Shull.

Mr. Haimbach exhibited specimens of *Crambus daeckellus* and *placidellus* and *Haematopsis grataria* var. *annettearia*, and presented cotypes of the two latter. Mr. C. R. Boerner said Dr. Chittenden had revised the genus *Sphenophorus* and had described a species taken at Sea Isle City, New Jersey, by the speaker, under the name *marinus*. He also mentioned having taken sixteen specimens of *Stenolophus alternans* Lec., at Neshaminy Falls, Pa., on May 13th. He had previously found single specimens at South Camden, New Jersey, and East Park, Philadelphia. Dr. Skinner exhibited specimens showing complete intergradation between *Thecla calanus* and *edwardsii*. Dr. Calvert exhibited *Argia moesta* Hagen, found at Grand Canyon; Nuevo Laredo and Lake Chapala, Mexico, etc., and described the differences in both sexes in the specimens from these various localities. These differences were illustrated by averages. The question of the specific identity or difference in the forms was raised.

HENRY SKINNER, *Recorder.*

A meeting of the American Entomological Society was held December 27, 1906. In the absence of the President and Vice-President, Mr. Philip Laurent was called on to preside. Thirteen persons were present. The annual reports were read. The Society voted to donate its publications to the California Academy of Sciences, so far as they could be supplied. The following were elected officers to serve for the ensuing year: President, Philip P. Calvert; Vice-President, H. W. Wenzel; Treasurer, E. T. Cresson; Recording Secretary, Henry Skinner; Corresponding Secretary, J. H. Ridings; Curator, Henry Skinner. Publication Committee—E. T. Cresson, C. F. Seiss, B. H. Smith.

HENRY SKINNER, *Secretary.*

A meeting of the American Entomological Society was held February 28, 1907. Dr. Philip P. Calvert, President, in the chair. Fourteen members were present. An invitation was read asking the Society to appoint delegates to the Seventh International Zoological Congress, to be held in Boston. The President was authorized to appoint one or more delegates.

Mr. Wenzel exhibited specimens of *Cartodere costulata* and *Adistemia watsoni,* taken in boxes of mouldy and discarded entomological specimens in the entomological rooms of the Academy of Natural Sciences of Philadelphia. He gave the distribution of the species in accordance with Mr. Fall's paper on the Latridiidæ.

Dr. Skinner exhibited a series of *Megathymus neumoegeni* showing great variation.

Mr. Rehn said we must recognize two kinds of variation, individual and geographical, and spoke of these characters as exhibited in the Orthoptera.

Dr. Calvert verbally reviewed Tower's work on *Leptinotarsa.*

Mr. Haimbach exhibited a slide showing the neuration of *Crambus caliginosellus.* Mr. Rehn called attention to the work by B. von Wattenwyl and Redtenbacher on the Phasmidæ. The senior author is eighty-three years old, and says that this is his last work. About seventy per cent. of the species listed are new. The general scope of the work and the new classification were mentioned.

Dr. Calvert exhibited specimens of the Australian cockroach, *Periplaneta australasiae,* taken in the Biological Hall, University of Pennsylvania, Philadelphia, in the present winter, and stated that previously this species had not been noted there; the greenhouses connected with the building afforded a likely means of introduction. He also stated that Mr. Haimbach's capture of *Argia translata* mentioned in the NEWS for January, 1907, p. 32, should be corrected as being the first record for *Eastern* Pennsylvania, since Mr. Williamson had reminded him that Mr. Gra had recorded this species from *Western* Pennsylvania in the NEWS for 1902, p. 113. Mr. Rehn recorded having found *Periplaneta truncata* in numbers at Jacksonville, Florida.

HENRY SKINNER, *Secretary*.

A meeting of the American Entomological Society was held April 24, 1907. In the absence of the President and Vice-President, Dr. D. M. Castle was called on to preside. Fifteen persons were present.

Mr. Rehn exhibited specimens of a katydid of the genus *Scaphura* which bear a striking resemblance to wasps of the genus *Pepsis*.

Mr. Viereck said Mr. Daecke had brought in a bee of an *Andrena* group which may be the male of an undescribed species. The characters of the genus were mentioned, particularly the elongated head. It was found by Mr. Daecke feeding on an ericaceous plant at Iona, New Jersey, on April 2.

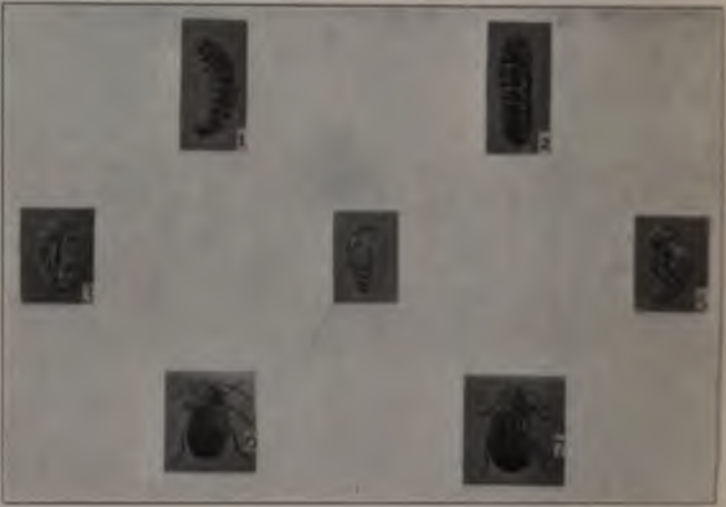
Mr. Laurent said insect life was scarce in Florida during January, February and March, the weather being very dry.

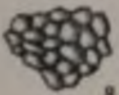
Mr. Rehn made some remarks on the Orthoptera collected in Florida by Mr. Hebard and himself in August, 1905. The most interesting species were exhibited, and the amount of geographic variation of certain of the species in the Southeastern States was discussed. Several of the species of which se were collected were previously known only from unique types.

Dr. Skinner exhibited specimens of *Chrysophanus arethusa* Wolley Dod.

Mr Daecke exhibited some Diptera taken by Mr. Laurent in Florida, and called particular attention to *Chrysops vittatus* taken in March, which does not appear here until July.

HENRY SKINNER, *Secretary*.

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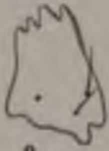
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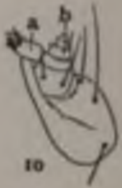

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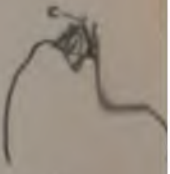

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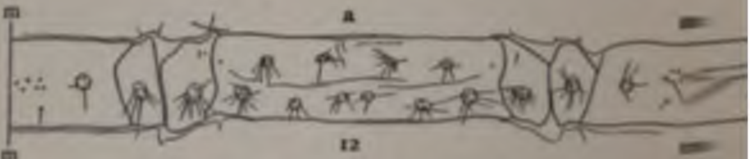

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DAVIS.—GALERUCA POMONAE

Figs. 1 and 2, larva; figs. 3, 4 and 5, pupa; fig. 6, male beetle; fig. 7, female beetle; fig. 8 portion of egg mass; fig. 9 mandible of larva; fig. 10 maxilla of larva; *a*, maxillar lobe; *b*, palpus; fig. 11, maxillar lobe; *c*, sensory organs; fig. 12, complete integument of an abdominal segment, cut along the median ventral line and spread out; *a*, anterior edge; *mm*, median ventral line.

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Life-History and Habits of Galeruca pomonae Scopoli, in Illinois.

JOHN J. DAVIS, University of Illinois, Urbana, Ill.

(Plate IX)

So little is known of the life-history and habits of *Galeruca pomonae* in this country, that the following observations, made last year, are worth recording.

Mr. Frederick Knab has reported the occurrence of this European species in North America, in ENTOMOLOGICAL NEWS, Vol. 16, page 230. It was found by him in the collections of the Illinois State Laboratory of Natural History and of Mr. Chas. Dury. The Illinois specimens were reared by Mr. C. A. Hart from larvae collected at Urbana, Ill., and Mr. Dury's specimens were taken at Cincinnati, Ohio. This species had previously been confused with *G. externa* and *tanaceti*. (ENT. NEWS, Vol. 14., p. 146 and *loc. cit.*)

Outside of Illinois it is known to have been taken only at Cincinnati, Ohio, where about the year 1878 Mr. Dury collected the adults in May and June by "sweeping low vegetation in shady places." This is the earliest record of its presence in this country. Mr. Dury also writes me that Miss Brown h lately taken this species at Spring Grove Cemetery, Cinci nati, Ohio. In Mr. Knab's article it was mentioned as havi been taken by Prof. W. S. Blatchley in Indiana, but Pr Blatchley writes me that the specimens in question prove be *Galerucella dorsata* Say.

The Illinois specimens mentioned by Mr. Knab were rear from larvæ found by Mr. Hart feeding on *Phlox divaricata* a *Dentaria laciniata* near Urbana, May 12, 1888, the beetl emerging June 16 and 18. In all our observations of the pa two years, however, they have been found only on *Phl divaricata*.

In Planzenfeinde, p. 374, Kaltenbach gives the food plan in Europe, as *Centaurea jacea, Cirsium palustre* and *Scabio succisa*.

In the last few years Mr. Hart has collected the larvæ Urbana, Homer, and Muncie, Illinois, and adults at Wh Heath, Illinois. I have collected larvæ at Urbana, Homer, a Muncie, Illinois, and adults at Homer and Urbana—the on places where I have looked for them, during the months which they occur as adults. All these places are within radius of thirty miles from Urbana, but the actual range of t species is probably much more extensive.

All specimens, both larval and adult, were collected at t edge of the woods, or in the woods, where *Phlox divarica* grows, this being the only food plant upon which I ha found the species. All the beetles which I collected were fou around the phlox plant, and usually under leaves at the ba of a plant.

The clusters of phlox plants upon which the larvæ we found in Urbana in 1905 occupied an area of not more tha ten or fifteen square feet, and in 1906 the larvæ were not fo beyond this same limited area, although this was not due to a scarcity of the food plant. Similarly, at Muncie, Ill about twenty-three miles east of Urbana, the infested plan were limited to an area of a few square yards, an area no large than that of the year before at the same place (May 14, 1906). Mr. Hart found the larvæ abundant at Homer, Illinois, a shor distance from Urbana. Here again the larvæ were remarkably local in distribution, the distribution being far less extensive than that of their food plant. These facts seem to show that these beetles spread very slowly and this is probably the reason why the species is not more evenly and more abundantly distributed in this country, although in Europe they are sometimes quite common and in some cases they have been very destructive.

My attention was first attracted to this insect in the spring of 1905, when larvæ were found on *Phlox divaricata* at Urbana and Muncie, Illinois. In 1906 larvæ were also collected at these two places as well as the other places mentioned above.

I have worked out all the essential details of the life history. There is but one brood a year. Briefly, the eggs hatch during April or early in May. The young larvæ feed on the leaves of phlox and become full grown during the latter half of May. They enter the earth to pupate, and emerge as adult beetles early in June. The beetles also feed more or less on the leaves or stems of phlox during the entire season, and feed at night; during most of the day they remain hidden under leaves at the base of the plant. About the middle of August they begin to pair and to lay eggs. The beetles gradually die off, leaving the eggs to survive the winter.

The following details of the life-history were obtained last summer in the insectary. Larvæ were first found April 27 on Phlox along the north edge of a wood, at the outskirts of Urbana. Most of these larvæ measured about ⅛ inch in length, two of them, however, measuring about 3/16 inch, and they were probably but a few days old. At this stage they fed only on the epidermal parts of the leaf, but as they increased in size they ate the entire leaf. On May 4 and 10, at Muncie, larvæ of all sizes were found, some being ½ inch in length. Other larvæ were collected at Homer, May 14 and 16, and at Urbana again, May 22. The larvæ grew to a length of about ½ to ⅝ inch and by May 14 they had begun to disappear into the earth to pupate. In the insectary, larvæ were found above the earth as late as May 26. The larvæ would dig ½ to 1 inch into the soil and there form a cocoon consisting of a few silken

threads with particles of earth interwoven. The larva r
mained as such in this cell for five or six days before transforn
ing to a pupa. The pupal stage lasted about two weeks a
the adult emerged within sixteen to twenty days after the lar
entered the earth. After emerging, the adult feeds upon t
leaves and tender shoots of the phlox plant. For the first fe
weeks after emergence the adult eats the leaves voracious
but later in the summer it feeds only occasionally. T
beetles were first noticed in copula August 15, and t
first eggs were laid on the upper surface of the leaves se
eral days later. The adults continued to pair and lay eg
until about September 15, at which date the beetles beg
to die, leaving only eggs to carry the species through to t
next year. Individual females usually lay three or fo
masses of eggs, each mass consisting of about fifty eggs. Thr
females laid, respectively, 80, 148 and 185 eggs, an avera
of 137 eggs per female.

Egg.—Eggs are laid in black masses (Fig. 8) of forty
more, the mass being round or oval, with a finely punctur
surface. The individual eggs are polygonal in cross sectio
and measure between ½ and 1 mm. in diameter.

Larva.—The rather stout, cylindrical larva (Figs. 1,
measure 14 mm. in length and 3.75 mm. in width. T
entire body is covered with numerous tubercles, from ea
of which arise from few to many setæ. The color of t
full grown larva varies from dark brown to almost bla
on the dorsal surface and a lighter brown on the ventr
Immediately after a molt the color of the larva is tempo
arily bright yellow.

The small inconspicuous head is dark brown or black, bei
darker than the general color of the body. The antennæ a
situated at one side of and near the base of the labrum. Th
is one pair of ocelli, which are situated above and slightly
one side of the antennæ. Around each ocellus is a dark re
Setæ are scattered abundantly over the head. The labru
is of the type typical for most chrysomelid larvæ and be
four prominent setæ, as well as a number of small and f
hairs. The mandible (Fig. 9) is quadridentate, its surfa

bearing three setæ. The maxilla (Fig. 10) is composed distally of the maxillary palpus (b) and the maxillar lobe (Fig. 10, *a*; Fig. 11). The conical maxillary palpus is four-segmented, the tip of the last segment being somewhat blunt and with a slight depression. The maxillar lobe terminates in a finger-like sensory organ (Fig. 11c), which is attached to a rather stout basal portion. Surrounding this organ are eight or more spines, which appear to be for the protection of the central organ. The labium is typical, bearing two-segmented labial palpi; the tip of the last joint of each labial palpus is blunt and with a slight depression, similar to that of the end segment of the maxillary palpus.

The thoracic segments are concolorous with the abdomen and bear numerouus tubercles, excepting, however, the prothorax. The cervical shield is bare of tubercles, but the prothorax bears a large tubercle just below, on each side of the shield and above the anterior pair of legs. On each of the second and third thoracic segments there are eight pairs of tubercles above the legs, and each of these tubercles is abundantly supplied with setæ. On the ventral side of each thoracic segment is a pair of rather large tubercles situated in the middle of the segment and coalescing more or less into one large oblong tubercle. Posterior to these ventral tubercles and slightly farther apart is a pair of very small sub-tubercular areas, with a single seta arising from each. The more dorsal tubercles fall into four longitudinal rows. Legs rather short and stout; the femur and tibia are well developed, but the tarsus is small and bears a single claw.

Abdomen nine-segmented, with many setiferous tubercles arising from all the segments, except the ninth; color dark brown or almost black; spiracles are present on all abdominal segments, except the ninth; there are no abdominal legs. The tubercles are similarly situated on the first eight abdominal segments, but the dorsal tubercles differ from those of the thorax in that they do not fall into four longitudinal rows; the four anterior dorsal tubercles of each segment are more widely separated than the four posterior dorsal ones (Fig. 12). Besides these eight dorsal tubercles there is another pair at each lateral edge of the dorsal plate, making in all five pairs of tubercles on the dorsal plate. The lateral plate bears a single tubercle, as does also the sub-lateral plate. The ventral plate bears one distinct pair of tubercles near the side; on each side of the median line and very close together are groups of five to seven setæ, not situated, however, on any distinct tubercle. Posterior to these and farther apart is a single pair of setæ, which appear to arise from a very small tubercle or tubercular spot.

Pupa.—The bright yellow pupa (Figs. 3-5) varies in length from 8 to 11 mm. and has an average width of 4 mm. The pupæ of male beetles are all nearly 8 mm. in length, while those of female beetles are about 10 mm. long. The dorsal surface is slightly convex, and on each abdominal segment there are eight dorsal patches of inconspicuous spines, which correspond to the clusters of setæ of the four pairs of dorsal tubercles on the abdominal segments of the larva. Two tubercles occur on each side of each segment of the abdomen: one on the lateral and one on the sub-lateral surface, the former above and the latter below each spiracle; these tubercles bear many minute spines.

Adult.—The beetles (Figs. 6, 7) are rather broadly ovate, with the dorsal surface strongly convex and clove-brown in color. Males vary in length between 8 and 9 mm. and are 4 to 5 mm. in width. The females are noticeably larger, varying between 9 and 11 mm. in length and 5 to 6 mm in width. Eyes and antennæ black, the latter being eleven-segmented, and more or less abundantly covered with fine, light colored hairs. Prothorax covered with punctures and bearing four transverse protuberances, or callosities, two on each side of a median impressed line. Legs black; under side of tarsi with light colored pulvilli. Elytra with three shining black longitudinal costæ. The interspaces are covered with more or less confluent punctures. On the margin of each elytron is a narrow yellow band, which fades out at the tip of the elytron.

Since writing this article I have received another letter from Professor Blatchley informing me of the occurrence of *Ga* *eruca pomonae* in Indiana. He writes: "In looking over a miscellaneous collection of unplaced Coleoptera, which I have recently mounted, I find a specimen of *Galeruca pomonae* in the collection, taken in Laporte County, Indiana, on August 26, 1904."

A new genus and a new species of Neuroptera.

By Nathan Banks.

Our two small species of *Acanthaclisis* have long been recognized as not true members of that genus; I therefore propose a new genus as follows:

Paranthaclisis n. gen.

I establish this genus for *Acanthaclisis congener* Hagen and *A. hageni* Banks. It is readily known from *Acanthaclisis* by the fact that in the hind wings the anal vein runs into the margin of wing and is connected to the first branch of the cubitus by a cross-vein (in *Acanthaclisis* the anal runs into the first branch of the cubitus). The radial sector is connected to radius by only 10 or 12 cross veins (in *Acanthaclisis*, 20 or 30); in both wings the branches of the cubitus, instead of running directly to the margin, are bent outward, so as to give the appearance of a vein parallel to hind margin. The outer spur of each tibia is bent at a right angle near its middle.

Ululodes arizonensis n. sp.

Closely allied to *U. albifrons* Banks, having annulate antennæ, white hair on face, etc. It differs (1) in larger size, expanse 60 mm. (*albifrons* about 50 mm. or less); (2) in more brown hair near base of antennæ; (3) in having the base of antennal club and several joints before it wholly pale yellowish; (4) in that the last dorsal segment of abdomen is pale and has an isolated black spot each side near tip (in *albifrons* is a black stripe each side); (5) in that the forewings are scarcely emarginate at end of median vein (in *albifrons* this emargination is very distinct); (6) in that the superior appendages of the ♂ are more geniculate at base, and more bent downward and inward, so that, seen from the side, the tip of the abdomen shows an even curve (in *albifrons* these pieces project more outward).

Four specimens from Palmerlee, Arizona (Biederman). The female shows four spots on each hind wing; one large, on hind margin toward base; one just behind the pterostigma, one on hind margin behind the last, and another somewhat basad of the latter.

New Micro-lepidoptera.

By Henry Engel, Merrick Museum, New Brighton, Pa.

The species of Microlepidoptera described herewith are part of a large number of species sent to Mr. Busck last winter for determination.

After studying this material Mr. Busck pronounced these and several other species new and suggested that I describe them.

My limited experience with the generic study of Microlepidoptera precluded the possibility of my giving them their proper position and I gladly accepted the kind offer of Mr. Busck to give me notes on, and generic determinations of these species.

The diagnosis of the new genus *Synallagma* was prepared by Mr. Busck. I gratefully acknowledge my obligation to him for determining several hundred species of Microlepidoptera for me.

Depressaria flavicomella n. sp.

Antennæ light ocherous. Labial palpi straw-yellow. On the basal half of the second joint a few brownish scales are intermixed outwardly Face and head cream color. Thorax pale yellow. Forewing straw yellow, with sulphurous hue. Base of wing concolorous with thorax. A diffuse rusty clouding over basal part of wing along dorsal margin and almost to costa An inwardly oblique brown shade from the outer discal spot to the dorsal suffusion Outer discal spot centered with white bordered with blackish outwardly. Inner discal spot small and black. Discal and apical area sparsely obscured by brownish scales Along the costa is a series of brown spots, becoming more pronounced on the apical half of the wing A row of brown spots along outer margin Cilia concolorous with ground color Hind wing silvery white slightly darkened in apical region A faint interrupte line at base of cilia Cilia silver white Forewing beneath dar ocherous, costa marked with pale yellow. Hindwing silvery whi Abdomen pale yellow with two lateral brown lines on under si Legs silver gray

Expanse, 15 16 mm

Hab. New Brighton, Pa., June 12-27 (Merrick), Oak St tion, Pa. (Marlott).

Type No. 10,284, U. S. National Museum. Cotypes in th Merrick Museum, New Brighton, Pa.

This species is allied to *Depressaria senicionella*, Busck. M Busck kindly loaned me a cotype of it for comparison. The pa yellow forewings, silvery hind wings, and smaller size easily separate it from *senicionella.*

I have before me 22 specimens, all taken at light in a dense forest during June, 1904-1906. Although I have found nearly all the local species hibernating, the only records for this species are in June.

Elaschista albicapitella n. sp.

Antennæ dark brown, gray near tip. Labial palpi silvery white, second joint fuscous beneath. Face silvery white. Collar and thorax a rich dark brown with purplish reflections. Lower edge of patagia and posterior edge of thorax white. Forewing elongate, width of the wing one-third of its length, apex produced. Ground color dark brown. Base of wing yellowish white. A prominent silver white fascia two-fifths from base of wing, extending from costa to dorsal margin, slightly bent outward over cell then straight to dorsal margin. A silver white fascia one-fifth from apex, outwardly oblique, nearly to center of wing. A triangular silvery white spot on dorsal margin, three-fourths from the base, outwardly oblique. Cilia dark gray sprinkled with brown. Hind wing dark fuscous, cilia dark gray. Abdomen dark brown above, pale yellow beneath. Legs brown above, whitish beneath. Underside of forewing blackish, with the outer fascia indicated on costa. Underside of hind wing same as upper side.

Expanse, 8 mm.

Hab.—Pittsburgh, Pa., June 12-17 (Engel).

Type. No. 10,285, U. S. National Museum. Cotypes in the Merrick Museum, New Brighton, Pa.

This species is nearest to the European *Elachista albifrontella,* Hubner, from which it differs in the darker ground of the front wings, the white patagia and the white base of the forewings. The inner fascia is also quite a contrasting difference. An authentic specimen of *albifrontella* was loaned to me by Mr. Busck for comparison.

SYNALLAGMA n. gen.

Head smooth. Labial palpi long, recurved, smooth; terminal joint shorter than second joint, acute. Max. palpi obsolete. Antennæ with basal joint elongate. Forewing elongate lanceolate, with tip produced and hooked downward. 11 veins, vein 11 absent; 7 and 8 stalked to costa; 6 into hooked apex; Ib strongly furcate at base. Hindwing lanceolate, half as wide as forewing. 8 veins, 3 and 4 connate, cell open between 4 and 5, 6 and 7 connate; 7 separate. Posterior tibiæ above with short hairs.

Type of genus *Synallagma busckiella* (Engel).

Synallagma busckiella n. sp.

Antennæ dark gray annulated with silver gray rings, basal joint thickened with scales. Face silver gray, head and thorax covered with flattened scales with coppery green luster. Labial palpi cream color, second joint fuscous beneath, terminal joint with dark line outwardly, tip cream white. Forewing light brown, with strong metallic reflections. A longitudinal cream white line from the base through middle of wing ending in the cell. Beneath terminal of this line a narrow line of like color commences and runs slightly divergent outwardly to the fold. A narrow line of about two-thirds the wing length on the fold near the inner angle. A few bluish black spots at lower end of cell edged with silvery scales. A black ocellus at the apex at beginning of the produced tip. On the costa above the ocelli is a cream white patch divided by a brown fascia. Cilia along termen dark gray, on the curved tip of apex the cilia are short and whitish. Hind wing dark gray with a silvery luster. Cilia concolorous. On the under side both wings are ocherous without any markings. Abdomen gray with coppery reflections above, silver gray beneath. Legs silver gray marked with fuscous above. Expanse, 9-10 mm.

Hab.—Pittsburgh, Pa., June 28, July 18, August 17, Sept. 29 (Engel), Oak Station, Pa. (Marloff).

Type No. 10,286, U. S. National Museum. Cotypes in the Merrick Museum, New Brighton, Pa.

I take pleasure in naming this interesting species in honor of Mr August Busck.

Gracilaria pennsylvaniella n. sp.

Antennæ as long as forewing, light brown with narrow gray annula
tion. Labial palpi silver white, terminal joint shaded with brown. F
and head silver white, with central indistinct golden line to coll
Collar and thorax golden brown with a silvery line above pata
Ground and forewing golden brown. Along the costa are four silv
fasciæ edged with black, situated as follows The first one a tr
more than one fourth from base, outwardly oblique, nearly to mid
of wing, curved toward costa Second fascia a little beyond mid
of costa, outwardly oblique, to middle of wing, curved toward co
Third fascia is short one fourth from apex, outwardly oblique
fourth at the beginning of the costal cilia is short, inwardly obliq
A subbasal silvery streak from the dorsal margin reaching the fold o
fourth from base An outwardly oblique silvery streak from mid
of dorsal margin to fold A second dorsal streak near inner an
to fold ending near the third costal fascia, edged strongly with bro
scales at the point On the middle of the wing, at apical fourth, a
cluster of bright golden scales, a blackish spot centered with silv
just below the apex Cilia along apical curve white, becoming d

gray along dorsal edge. Hindwing blackish brown, cilia dark gray. Abdomen gray, anal segment white. Legs white with brown shadings, and brown annulations on tarsal joint.

Expanse, 8-8.5 mm.

Hab.—Pittsburgh, Pa., May 14-27, August 11, October 5 (Engel), Oak Station, Pa. (Marloff).

Type No. 10,287, U. S. National Museum. Cotypes in Merrick Museum, New Brighton, Pa.

This species is near *Gracilaria lespedezaefoliella* Clem., but the larger size, bolder ornamentation, and the comparatively long basal streak separate it from that species.

Tinagma crenulellum n. sp.

Antennæ gray, annulated with ocherous. Labial palpi and head whitish gray. Forewing ocherous strongly dusted with white, giving a speckled appearance to the wing. A broad dark ocherous fascia on the middle of the wing of equal width on costal and dorsal edge. This fascia is poorly defined basaly, but distinctly edged with white outwardly. A pale gray shade crosses the wing beyond this central fascia extending nearly to the apex. Apical part of wing dusted ocherous, cilia coarsely speckled with dark brown and white. Hind wings ocherous, cilia smoky gray. Abdomen ocherous. Legs grayish.

Expanse, 8.5-9.5 mm.

Hab.—Pittsburgh, Pa., May 27-31, 1906, (Engel), New Hampshire.

The latter record was reported by Mr. Busck who received this species from New Hampshire since he had my material for study.

Type in the U. S. Nat'l. Museum. Cotypes in the Merrick Museum, New Brighton, Pa. This species is very close to, if distinct from, the European *Tinagma perdicellum* Zeller It seems advisable to keep it under a separate name until the iden- ity shall eventually be proven by the breeding of both species. he American species has the labial palpi and head whitish, not herous, as in the European species, and the central fascia of e forewing has a different angle, more perpendicular not in- ardly inclined on dorsal edge as in *perdicellum*. These dif- rences alone would hardly justify the separation of the nerican form, but it is easier to prove the two forms syno- ms than to disprove the faulty record of the European cies here.

Andrenae of the Canadian, Alleghanian and Carolinian Plant Zones occurring or likely to occur in Connecticut.

By H. L. Viereck.

TABLE OF SPECIES.

Females.

The head, when viewed from in front, is as long as wide or nearly so . 1.
The head, when viewed from in front, is distinctly longer than wide 24

1. Abdomen with the second dorsal segment depressed less than one-half . . . . 2.
   Abdomen with the second dorsal segment depressed one-half or more than one-half . . . . 19.
2. First joint of the flagellum shorter than the next two joints combined . . . . 3.
   First joint of the flagellum as long as or longer than the next two joints combined 4
3. Clypeal punctures not adjoining. Facial fovea more than one-half as wide as the distance between the eye and the lateral ocellus and extending below the antennal line; wings dark brownish, pubescence whitish.
   Enclosure closely wrinkled . . . . crataegi.
   Enclosure with several widely separated striae.
   alleghaniensis n. sp.
   Very like the preceding, but easily distinguished from it and any [illegible] its known allies by the very compact punctuation of the clypeus, the punctures being regular and adjoining or so nearly adjoining as to give the impression that they are adjoining.
   daeckei n. sp.
4. Facial fovea separated from the eye margin by a narrow space, fa[illegible] fovea more than one-half as wide as the distance between eye and the lateral ocellus; facial fovea extending below antennal line, the hairs of the outer side of the posterior ti[illegible] simple; wings with three submarginal cells . . . . [illegible]
   Facial fovea not separated from the eye margin by a narrow sp[illegible] only a shining line intervening in some species . . . . [illegible]
5. Facial fovea one-half or less than one half as wide as the distan[illegible] tween the eye and the lateral ocellus . . . . [illegible]
6. Facial fovea not extending below the antennal line . . . . [illegible]
   Facial fovea extending below the antennal line . . . . [illegible]
7. Most of the hairs on the outer side of the posterior tibiae simple [illegible] mose or branched . . . . . . [illegible]
8. Cheeks rounded, without a margin behind . . . 11
   Cheeks rounded, but with a margin behind 12

11. Most of the hairs on the outer side of the posterior tibiae simple . 30.
Most of the hairs on the outer side of the posterior tibiae plumose or branched . . . . 44.

12. Most of the hairs on the outer side of the posterior tibiae simple . 45.

13. Fovea extending below the antennal line . . . . 15.
Fovea not extending below the antennal line . . . . 14.

14. Most of the hairs of the outer surface of the posterior tibiae plumose or branched . . . . 46.

15. Most of the hairs of the outer surface of the posterior tibiae simple . . . . 16.
Most of the hairs of the outer surface of the posterior tibiae branched . . . . 18.

16. The posterior tibiae at their apex twice as wide as the metatarsus . 49.
The posterior tibiae at their apex not twice as wide as the metatarsus . . . . 17.

17. Species with three submarginal cells . . . . 50.
Species with two submarginal cells . . . . 78.

18. Species resembling *arabis* and allies . . . . 79.

19. Abdomen with the second dorsal segment depressed three-fourths or more . . . . 22.
Abdomen with the second dorsal segment depressed less than three-fourths . . . . 20.

20. The shining space between the facial fovea and the eye margin abruptly separated from the fovea . . . . 21.
The shining space between the facial fovea and the eye margin not abruptly separated from the fovea . . . . 89.

21. The shining foveal space as wide as, or not as wide as, the fovea below . . . . 90.

22. The first joint of the flagellum shorter than the second and third joints combined . . . . 23.

23. The shining foveal space as wide, or not as wide, as the fovea below . . . . 95.
The shining foveal space wider than the fovea below . . . . . . 98.

24. The fovea extending below the antennal line . . . . 99.

25. Abdomen satiny . . . . 26.

26. The abdomen without patches that are more conspicuously satiny than the surrounding areas . . . . 27.
The abdomen with patches that are more conspicuously satiny than the surrounding areas . . . . 28.

27. Eleven mm. in length, or nearly; process of labrum rather rounded; posterior legs with their tegument dark or black; pubescence on dorsum of thorax ochreous to reddish; scopa of posterior tibiae light in color; anal fimbria golden or brown . . **nivalis.**
Seven to eight mm. in length, or nearly; process of the labrum finger-shaped in outline; pubescence pale, *i. e.* whitish to ochreous; anal fimbria chocolate-brown or of an allied shade . . . **placida.**

28. Process of labrum rounded; abdomen with its tegument partly reddish, the first dorsal segment being black at base and apex. **erythrogaster rhodura.**
29. Ten mm in length; clypeus uniformly dullish, sparsely punctured, but impunctate along the middle; process of labrum nearly four times as wide as long; thorax and abdomen throughout more or less dullish, like the head, with the exception of the scutellum which is rather shining; pubescence pale, ochreous scopa of posterior tibiae composed of simple hairs that one might say look very like hair "standing on end;" abdomen subfasciate; color of the anal fimbria sort of a golden brown, wings brownish, with sort of a yellowish tinge . . . . **cornelli.**
30. Abdomen black 31
31. Process of the labrum truncate, or semicircular, or when seen from below, subemarginate 32
Process of the labrum otherwise 43
32. Enclosure of the metanotum granular 33
Enclosure smooth 38
33. The greater portion of the longitudinal middle third of the clypeus impunctate 34
The clypeus not so 35
34. The clypeus with a rather circular impunctate area, which is usually highly polished and conspicuous; abdomen subfasciate. **flavoclypeata.**
35. The clypeus with a narrow but distinct median impunctate space 36
36. The clypeus very sparsely punctured . . . . **robertsoni.**
The clypeus closely punctured 37
37 Pubescence ochreous to brownish ochreous; abdomen dull clypeus somewhat flattened . . . **arabis.**
38 The tips of the wings distinctly clouded . . . 39
The tips of the wings not so 40
39 Clypeus abundantly and distinctly punctured . **nubecula.**
40. Dorsulum dull 41
Dorsulum shining 42
41 Clypeus dull and smooth . . . . **distans.**
42 The abdomen dull . . . . **canadensis.**
43 Process of the labrum finger-shaped; the anal fimbria from pale brown to blackish in color, usually the latter . **placida.**
44 Abdomen black, scopa of posterior tibiae loose, i. e. with its hairs sparse . . . . . **geranii-maculati.**
45 Process of the labrum quadrate or nearly so, and margined **fragilis.**
Process of the labrum rounded, not margined . . **integra.**
46 Face immaculate 47
Face maculated 48
47 Process of the labrum emarginate; clypeus roughened and indistinctly punctured; the dorsulum and scutellum shining. . **solidaginis.**

48. Process of the labrum not, or hardly, emarginate; clypeus sparsely punctured . . . . **pulchella.**

49. Enclosure of the metanotum conspicuously granular . . . . . **nasoni.**

50. Abdomen not distinctly punctured . . . . 51.

Abdomen distinctly punctured . . . . 63.

51. Abdomen appearing bare, with no abundant erect hairs . . . . . 52.

Abdomen not appearing bare, with no abundant erect hairs . . . 53.

52. Abdomen and scopa with pale pubescence; wings pale brownish, testaceous; abdomen fasciate; clypeus distinctly punctured and shining . . . . **novae-angliae** n. sp.

53. Abdomen and scopa with pale pubescence . . . . 54.

Abdomen above and scopa with dark pubescence . . . . 60.

54. Abdomen without distinct bands of nearly erect pubescence . . . 55.

Abdomen with distinct bands of nearly erect pubescence . . . . 56.

55. Face with no black pubescence; abdomen fasciate, shining; clypeus with a median impunctate space . . . . **mandibularis.**

56. Clypeus dull . . . . 57.

Clypeus shining . . . . 59.

57. Nearly all of the scopal hairs white . . . . 58.

58. Anal fimbria gray and fuscous . . . . **cockerelli.**

59. Scopa golden . . . . **mandibularis.**

60. Abdominal pubescence mostly pale . . . . 61.

Abdominal pubescence mostly black . . . . 62.

61. Face with yellowish pubescence . . . . **hirticincta.**

62. Clypeus with a median impunctate space . . . . . . **milwaukeensis.**

63. Abdomen and scopa with pale hairs . . . . 64.

Abdomen and scopa with dark or black hairs . . . . 73.

64. Clypeus with no distinct, shining, median impunctate space . . . 65.

Clypeus with a distinct, shining, median impunctate space . . . 72.

65. Enclosure of the metathorax not rugulose, at most granular . . . 66.

Enclosure of the metathorax rugulose . . . . 72.

66. Clypeus dull . . . . 67.

Clypeus shining. . . . . 68.

67. Clypeus very closely punctured, appearing granular; posterior tibiae honey-yellow; scopa thin, not obscuring the tegument. **winkleyi** n. sp.

68. Clypeus not produced . . . . 69.

Clypeus produced . . . . **davisi** n. sp.

69. Posterior tibiae honey-yellow . . . . 70.

Posterior tibiae blackish . . . . 71.

70. Abdomen subfasciate . . . . **commoda.**

71. Enclosure wrinkled, process of labrum semicircular in outline. **cressoni.**

72. Enclosure not entirely rugulose . . . . **hilaris.**

73. Species with some pale pubescence . . . . 74.

74. Face and pleura with pale pubescence . . . . 74.

Face and pleura with some black pubescence . . . . 76.

75. Clypeus with an indistinct median impunctate space . **vicina**
76. Clypeus with a median impunctate space . . . . [illegible]
77. Species over 12 mm. long; dorsum of thorax with no black pubescence . . . . **carlini**
78. Process of labrum forming an obtuse-angled triangle; abdomen black . . . . **andrenoides-wellesleyana**
79. Process of labrum emarginate . . . . [illegible]
    Process of labrum not emarginate . . . . [illegible]
80. Process of labrum truncate anteriorly, the truncation wider than the process is long; clypeus shining, not densely punctured, clypeus not maculated . . . . [illegible]
81. Clypeus with a median impunctate space . . . . . [illegible]
    Clypeus with no median impunctate space . . . . . [illegible]
82. Most of the middle third of the clypeus occupied by the impunctate space; species resembling *flavoclypeata* **pennsylvanicola** n. sp.
83. Species approximately 13 mm. long . . . . [illegible]
84. Clypeus polished . . . . **helianthi**
    Clypeus not polished . . . . **braccata** n. sp.
85. Clypeus not dull . . . . [illegible]
86. Clypeus not densely punctured . . . . [illegible]
87. Clypeus with a median impunctate space . . . . [illegible]
88. Scopa loose . . . . **[illegible]** n. sp.
    Scopa compact; wings blackish . . . . **asteris**
89. Process of labrum broadly truncate; clypeus with no distinct median impunctate space; the second dorsal abdominal segment depressed practically one-half . . . . **rehni** n. sp.
90. Second dorsal abdominal segment depressed one-half . . . [illegible]
    Second dorsal abdominal segment depressed more than one-half [illegible]
91. Abdomen black . . . . [illegible]
    Abdomen red . . . . [illegible]
92. Abdomen fasciate . . . . . **forbesii**
    Abdomen not fasciate . . . **mariae** var. **concolor**
93. Abdomen not fasciate . . . **mariae**.
94. Posterior tibiae and tarsi black or blackish, abdomen not fasciate **woodi** . .
    Posterior tibiae and tarsi black or blackish, abdomen fasciate **obscura**
    Posterior tibiae and tarsi honey yellow . . . **hippotes**
95. Second abdominal segment depressed two-thirds [illegible]
    Second abdominal segment depressed more than two-thirds [illegible]
96. Abdomen densely punctured, its segments with no testaceous margin . . . **multiplicata**
97. Abdomen black, depressed portion of second dorsal abdominal segment indistinctly punctured, punctures of the clypeus [illegible] enclosure coarsely rugose **spiraeana**
    Abdomen fasciate, depressed portion of second dorsal abdominal segment indistinctly punctured, clypeus with no median impunctate space, posterior tibiae blackish . . **multiplicatiformis** n. sp.

98. Dorsulum with its punctures adjoining or nearly so; the shining space of the face rather oblong.
Abdomen not fasciate . . . . **rugosa.**
Abdomen fasciate . . . . **paenerugosa** n. sp.
99. Pubescence pale; anal fimbria brown . . . . **bradleyi** n. sp.

MALES.

Head viewed from in front as wide as, or wider than long . . . . . . 1.
Head viewed from in front longer than wide . . . . 32.
1. Abdomen with the second segment depressed less than one-half, or at most depressed one-half . . . . 2.
2. Third joint of the antennae shorter than the next succeeding joint or just as long . . . . 3.
Third joint of the antennae longer than the next succeeding joint . 8.
3. Penultimate ventral segments with reflexed angles . . . . . **crataegi.**
Penultimate ventral segments with no reflexed angles . . . . . . 4.
4. Second dorsal segment depressed one-third . . . . . **daeckei** n. sp.
Second dorsal segment depressed one-half or less than one-half, but more than one-third . . . . 5.
5. Antennae smooth and shining; enclosure rugose . . . . . . **forbesii.**
Antennae smooth and shining; enclosure rugose . **mariae** var. **concolor.**
Antennae smooth and shining; enclosure granular . . **winkleyi** n. sp.
Antennae dull . . . . 6.
6. Abdomen more or less reddish . . . . **mariae.**
Abdomen black . . . . 7.
7. Tarsi yellowish . . . . **hippotes.**
Tarsi blackish or brownish; enclosure rugose . . . . **weedi.**
Enclosure granular . . . . **nasoni.**
8. Face maculated with yellow or whitish . . . . 25.
Face immaculate . . . . 9.
9. Third joint of antennae longer than fourth but shorter than fourth or fifth joints combined . . . . 10.
Third joint of antennae as long as, or longer than the fourth and fifth joints combined . . . . 24.
10. Cheeks prominently angulate or keeled . . . . 11.
Cheeks neither angulate nor keeled . . . . 20.
11. Cheeks prominently angulate, not keeled . . . . 12.
Cheeks keeled . . . . **fragilis.**
12. Mandibles toothed on the under side near the base . . . . 13.
Mandibles not toothed on the under side near the base . . . . . 16.
13. Tooth on the under side of mandibles a mere angle . . . . 14.
14. Pubescence of abdomen pale . . . . **mandibularis.**
Part of the pubescence of abdomen dark . . . . . . **milwaukeensis.**
16. Face with some black pubescence . . . . **cockerelli.**
Face with no black pubescence . . . . 17.
17. Wings in part distinctly clouded with brownish . . . . . . **nubecula.**
Wings not so . . . . 18.

18. Dorsulum polished . . . . **canadensis.**
Dorsulum dull . . . . 19.
19. Abdomen dull, with ochreous erect pubescence . . . . . **hirticincta.**
Abdomen shining, with appressed pubescence . **erythrogaster rhodura.**
20. Part of the facial pubescence black . . . . **carlini.**
Face with no black hairs . . . . 21.
21. Tarsi yellowish . . . . **nivalis.**
Tarsi brownish or blackish . . . . 22.
22. Third joint of antennae as long as succeeding joint . . . . **vicina.**
Third joint of antennae longer than succeeding joint . . . 23.
23. Abdomen sericeous . . . . **commoda.**
Abdomen not sericeous . . . . **placida.**
24. Angles of sixth ventral segment of the abdomen reflexed **erigeniae.**
Angles of sixth ventral segment of the abdomen not reflexed **distans.**
25. Wings with two submarginal cells . . . . **andrenoides.**
Wings with three submarginal cells . . . . 26.
26. Cheeks angulate . . . . **flavoclypeata.**
Cheeks not angulate . . . . 27.
27. Maculation confined to the clypeus . . . . 28.
Maculation not confined to the clypeus . . . . 30.
28. Third joint of antennae as long as fourth and fifth joints combined, or a little longer . . . . 29.
Third joint of the antennae longer than the fourth joint, but not as long as the fourth and fifth joints combined . . **robertsonii.**
29. Pubescence whitish; posterior femora black . . . . . **braccata** n. sp.
Pubescence tawny or ochreous; posterior femora partly yellowish **helianthi.**
30. Tarsi yellowish . . . . **pulchella.**
Tarsi brownish or blackish . . . . 31.
31. Abdomen distinctly punctured . . . . **cressonii.**
Abdomen not so . . . . **asteris.**
32. Clypeus maculated with yellow. . . . . **bradleyi** ♂.

Andrena (*Trachandrena*) *alleghaniensis* Vier.
" (*Trachandrena*) *cratægi* Robt. Sure to be found throughout the State.
" (*Trachandrena*) *daeckei* Vier. May be found in Connecticut along the Sound. Type locality Clementon, New Jersey.
" *nivalis* Sm. (= *A. pruni*, *A. dunningi*, *A.* [illegible], *A.* [illegible] *A. robertsonii*). Throughout the State.
" *placida* Sm. (= *A.* [illegible], *A.* [illegible], *A.* [illegible]). This is no doubt generally distributed throughout the State.
" *erythrogaster rhodura* Ckll. Type locality Hartford.

Andrena cornelli Vier. Type locality Ithaca, N. Y.
" *flavoclypeata* Sm. (= *A. bipunctata* of authors = *clypeata* = *clypeolata*). No doubt occurs throughout the State. It is one of the important pollinizers of apple, pear and other fruit blossoms.
" *robertsoni* D. T. (= *A. serotina*). Occurs with the preceding species, but is not so common.
" *arabis* Robt. This appears early in spring.
" *nubecula* Sm.
" *distans* Prov.
" *canadensis* D. T. (= *simulata*).
" *gerani-maculati* Robt.
" *fragilis* Sm. (= *platyparia* = *laticeps* = *provancheri*).
" *integra* Sm. (= *lineata*).
" *solidaginis* Robt. Late in summer and early in fall this species may be seen visiting the flowers of the goldenrod.
" *pulchella* Robt.
" *vestita* Prov. (= *nasoni* = *hartfordensis*). This is one of the pollinizers of fruit blossoms.
" *novae-angliae* Vier.
" *mandibularis* Robt. (= *thaspi*). This visits fruit blossoms and azalea flowers.
" *cockerelli* Graen.
" *hirticincta* Prov. (= *americana* = *fimbriata*). Visits flowers of the goldenrod and other flowers of late summer and early fall.
" *milwaukeensis* Graen.
" *winkleyi* Vier. Type locality Branford. Visits flowers of quince, raspberry and possibly other fruits.
" *davisi* Vier.
" *commoda* Sm. (= *corni*).
" *cressoni* Robt.
" *hilaris* Sm.
" *vicina* Sm. Visits flowers of some of the fruit trees.
" *carlini* Ckll. Occurs with the preceding.
" *andrenoides wellesleyana* Robt. Visits the willow.
" *pennsylvanicola* Vier.
" *helianthi* Robt. Visits the sunflower.
" *braccata* Vier. Visits goldenrod flowers.
" *angusi* Vier.
" *asteris* Robt. Received its name from its habit of visiting flowers of the aster.
" *rehni* Vier.
" *forbesi* Robt.
" *mariae* var. *concolor* Robt.
" *mariae* Robt.

tweedi Vier.
obscura Robt.
" *hippotes* Robt.
" *multiplicata* Ckll.
" *spiraeana* Robt.
" *multiplicatiformis* Vier.
" *rugosa* Robt.
" *pseudorugosa* Vier.
" *bradleyi* Vier. Visits flowers of the gooseberry, *Ribes canthoides* and huckleberry flowers, *Gaylussacia*.

List of Tachinidae taken in the City of Philadel

By H. S. Harbeck.

In the northern part of the City of Philadelphia, Pa
number of small woods that so far have been saved from
tation, but which I presume in a short time will be cut
to make ready for improvements. In such places I have
the very best kind of collecting for Diptera.

To enumerate all the specimens collected would take
much space of this Journal, but to give an idea of the
lent collecting to be had in these places, I give a list
species of one family, the Tachinidae, which I have col
in the past few years.

Sixty-two species are here listed, and my thanks are
Mr. D. W. Coquillett for the determination of most of the
and to Dr. L. O. Howard, of the Nat. Mus. for his kind
allowing me to send my material to the Mus. for determin

Cistogaster immaculata Macq., July 30.
Phorantha occidentalis Walk., July 2.
Myiophasia aenea Wied., Aug. 22.
Cryptomeigenia theutis Walk., May 20.
Admontia degeerioides Coq., Aug. 4.
" *tarsalis* Coq., Aug. 4.
" *nasoni* Coq., Sept. 8.
Celatoria diabroticae Shimer, Aug. 12.
Hypostena dunningii Coq., Aug. 12.
" *variabilis* Coq., Sept. 8.
" *floridensis* Town., June 10.
" *flaveola* Coq., June 4.
Macquartia pristis Walk., July 28.
Hyalomyodes triangulifera Loew., May 20.
Oestrophasia signifera V. d. Wulp., May 9.

Epigrimyia floridensis Town., Aug. 12.
Cyrtophloeba horrida Coq., April 21.
Plagia americana V. d. Wulp., July 6.
Distichona auriceps Coq., Sept. 24.
Senotainia trilineata V. d. Wulp., Aug. 12.
Belvosia unifasciata Desv., Sept. 24.
Linnaemyia compta Fall., Oct. 1.
Panzeria radicum Fabr., April 15.
Macromeigenia chrysoprocta Wied., July 16.
Gymnochaeta alcedo Loew., May 23.
Exoristoides slossonae Coq., June 21.
Exorista blanda O. S., Oct. 1.
" *eudryae* Town., July 28.
" *confinis* Fall., July 28.
" *nigripalpus* Town., July 30.
" *lobellae* Coq., June 12.
" *ceratomiae* Coq.. July 28
Euphorocera claripennis Macq., July 12.
" *cinerea* V. d. Wulp., April 15.
Phorocera leucaniae Coq , April 21.
Siphosturmia rostrata Coq., Aug. 26.
Acemyia dentata Coq., Aug. 2.
Tachina robusta Town., June 18.
" *mella* Walk., Aug. 21.
Winthemia quadripustulata Fabr., July 2.
Frontina setipes Coq., Sept. 24.
" *aletiae* Riley, June 18.
" *ancilla* Walk., June 26
Blepharipiza leucophrys Wied., July 21.
Masicera eufitchiae Town., Aug. 26.
" *chaetoneura* Coq., June 14.
Hilarella fulvicornis Coq., Aug. 12.
" *polita* Town., July 30.
Metopia leucocephala Rossi., Aug. 4.
Gonia capitata De Geer, April 2.
" *senilis* Will., April 2.
Spallanzania hesperidarum Will., July 2.
Gaediopsis ocellaris Coq., Sept. 21.
Chaetogadea analis V. d. Wulp., Sept. 21.
Cuphocera fucata V. d. Wulp., Aug. 1.
Peleteria robusta Wied , June 4.
Archytas aterrima Desv., Sept. 25.
" *analis* Fabr., Oct. 1.
Echinomyia dakotensis Town., Sept. 4.
" *florum* Walk., June 10.
Epalpus signiferus Walk., May 7.

Notes and Descriptions of Hippoboscidae and Streblidae.

By D. W. Coquillett.

Ornithomyia butalis Coq.

In *Entomological News* for March, 1907, (p. 103), Dr. Speiser expresses his belief that this species is synonymous with *avicularia* Linné. Besides the great difference in color, the two forms are readily separable by the venation; in *butalis* the apex of the second basal cell is slightly nearer to the apex of the anal than to the small crossvein; in *avicularia*, two European specimens of which are before me, the second basal cell is prolonged almost to the small crossvein, the distance never much exceeding the length of that crossvein.

Ornithomyia anchineuria Speiser (*pallida* Say, 1823, not Olivier, 1811

Nine specimens from localities ranging from Washington, D. C., to California, agree so well with Say's description as to leave no doubt in regard to their belonging to his species. I am unable to distinguish them from European specimens of *avicularia* Linné and believe that they belong to this holarctic species. In some of the specimens the crossvein at the apex of the second basal cell is practically interstitial with the small crossvein, as Say described it, but the position of this crossvein is variable in the different specimens

Lynchia brunnea Olivier.

Dr Speiser refers this species to the genus *Lynchia* with a query, but since the form which the writer independently identified as this species belongs to the present genus, and moreover since Olivier's description applies to this species better than to any other form which occurs in our fauna, there would seem to be no need for the query.

Lipoptena subulata n sp

Near *depressa* Say but larger, with a fasciate abdomen and a stout black spine at the apex of the inner side of the front tibiae. Head yellowish, middle of the front opaque brownish, the broad orbits polished and becoming blackish posteriorly, an elongate-oval, transverse, black ocellar spot and a pair of black spots between the antennæ. Thorax brown, the anterior part and the scutellum yellowish. Abdomen black, the base reddish yellow, the medio-dorsal region marked with a pale yellow triangular spot, followed by two fasciæ of the same color, the second one at its ends usually prolonged to the hind end of the abdomen; venter black laterally, the middle pale yellow; just before the anal opening in the female is a transverse row of three small chitinized brown spots. Legs light yellow; front and middle tibiæ devoid of spines, except at their apices, the front ones with a stout black apical spine reaching to apex of second tarsal joint, the middle tibiæ with a long, black spine and a second spine about one-half as long; hind tibiæ bearing a row of three along the inner side and a crown of four at the apex. Length 4 to 5 mm.

Woodstock, N. H. Six females and one male collected on deer in November, 1905, by Mr. John P. Long. Type No. 10,292 U. S. National Museum.

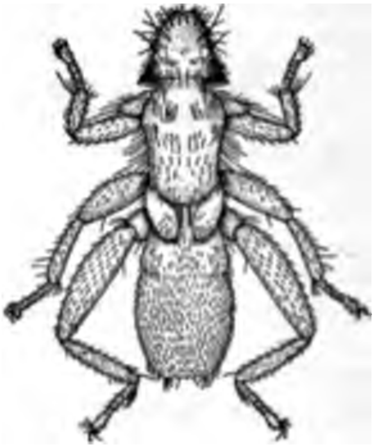
The form here considered as being *depressa* is represented in the National Museum by a fine series of specimens collected on a blacktailed deer by Mr. H. S. Barber, in Humboldt county, Cal. The habitat of Say's specimens is not at present known; in the original description he simply stated that this species "Inhabits *Cervus virginianus*," a kind of deer which, as at that time understood, ranged from the Atlantic to the Rocky Mountains. In the introductory remarks in the paper which contains his description of *depressa* he stated that the Diptera described therein "were chiefly collected by myself during the late expedition to the Rocky Mountains under the command of Major Long." It is altogether probable, therefore, that the specimens were obtained from a deer shot by one of the members of the expedition at some point between Arkansas and the Rocky Mountains. That it should also be found in northern California is not an improbable occurrence.

Aspidoptera busckii Coq.

This is given by Speiser as a synonym of *phyllostomatis* Perty, but is readily distinguished by the fact that the tibiae are only pubescent, while in *phyllostomatis*, four Brazilian specimens of which are before me, the tibiae are fringed with comparatively long bristly hairs.

METELASMUS n. gen. of Streblidae.

Near *Strebla* but the wings reduced to somewhat oval pads less than half as long as the thorax. Head depressed, somewhat bell-shaped, fringed around the margins with setae, the posterior end fringed with flattened spines below, at the sides and on the hind angles of the upper side; no antennæ, eyes or ocelli. Thorax somewhat injured in the single specimen before me, but apparently of the form shown in the figure; sternum sparsely covered with short, bristly hairs and fringed with setae around the front end, medium sulcus three-branched posteriorly. Abdomen and legs as in the figure. Type, the following species:



Metelasmus pseudopterus Coquillett

Metelasmus pseudopterus n. sp.

Head brownish yellow, a transverse pair of pale yellow spots near the middle, body dark yellow, legs pale yellow, aborted wings dark yellow and with a pale yellow costal spot before the middle of each, spines and bristles, like the tarsal claws, black; length 2.5 mm.

Sapucay, Paraguay, South America. A single specimen collected on a bat, *Artibeus lituratus*. Type No. 10293. U. S. National Museum.

The Bees of Nebraska.—III.

By Myron H. Swenk.

Family MACROPIDAE.

Genus **MACROPIS** Panzer.

1. **Macropis patellata** Patton.

Meadow, Nebraska, July 14, 1906, three males collected at a small white *Asclepias* (P. R. Jones).

2. **Macropis clypeata** n. sp.

♂.—Length 7 mm.; apparently very close to *M. morsei* Rob., but differing from the description of that species as follows: Pubescence of mesonotum pale and black intermixed, the dark hairs predominating only on the disk; only the clypeus yellow, the spots on the sides of the face and on mandibles lacking; wings smoky, the nervures and stigma black; tarsi wholly black; first two abdominal segments scarcely depressed apically and not fasciate.

Type—Warbonnet Canon, Sioux County, Nebraska, July 13, 1901, on *Pentstemon* (M. Cary). ♂.

Differs at once from *ciliata, patellata* and *steironematis* in the face marks and size.

Family DUFOUREIDAE.

Genus **HALICTOIDES** Panzer.

1. **Halictoides marginatus** Cresson.

Entire State (Lincoln, West Point, Neligh, Long Pine, Gordon, Bridgeport, Crawford, Glen and Warbonnet Canon), flying in great abundance at the flowers of the various species of *Helianthus,* and also on *Grindelia squarrosa, Solidago rigida, Convolvulus* sp. and *Carduus altissimus,* on the three last named flowers but rarely. In eastern Nebraska the season of flight is from August 7 to September 18, in Sioux County somewhat earlier, from June 26 to August 29.

2. **Halictoides maurus** Cresson.

Sioux County, Nebraska, June 13-28, at flowers of *Campanula petiolata.*

Family NOMIIDAE.

Genus **NOMIA** Latreille.

1. **Nomia foxii** Dalla Torre.

Lincoln, West Point and Dundy County, Nebraska, May 31 to July 12 at flowers of *Petalostemon violaceus.*

2. **Nomia nortoni** Cresson.

Lincoln, Nebraska City, Union and Harvard, Nebraska. June 9 to September 14, at flowers of *Solidago rigida, Grindelia squarrosa, Cassia chamaecchrista* and *Petalostemon violaceus.*

Genus **EUNOMIA** Cresson.

1. **Eunomia heteropoda** Say.

West Point and Ord, Nebraska, August.

2. **Eunomia apacha** Cresson.

Sioux County, Nebraska, a single female specimen taken.

Genus **EPINOMIA** Ashmead.

1. **Epinomia triangulifera** Vachal.

Lincoln, Nebraska City and Cedar Bluffs, Nebraska, August 4 to September 18 at flowers of *Helianthus annuus, Grindelia squarrosa, Polygonum hydropiper* and, less commonly, on *Solidago rigida* and *Vernonia* sp. also. This species has formed a large colony on the salt flats west of Lincoln.

Family BOMBIDAE.

Genus **BOMBIAS** Robertson.

1. **Bombias separatus** (Cresson).

This species is abundant over the entire State. Specimens before me are from Lincoln, Omaha, Beatrice, South Bend, Weeping Water, Nebraska City, West Point, Neligh, Niobrara, Springview, Gordon and Sioux County. The females commence to fly in late April, principally upon the flowers of *Prunus, Salix, Ribes, Rubus, Malus, Astragalus* and *Lonicera* the workers appear in numbers during the third week in June, visiting during the summer and fall the flowers of *Petalostemon, Psoralea, Verbena, Symphoricarpos, Monarda, Cassia* and *Solidago,* the males are abundant during September and October on *Carduus* and *Helianthus.*

2. **Bombias scutellaris** (Cresson).

Of our three common eastern Nebraska *Bombias* this species is the least plentiful. It is present over the entire State, but is more common eastwardly, having been captured at Lincoln, Omaha, Nebraska City, West Point, Carns and in Sioux County. It flies from early June to early October, chiefly on *Petalostemon, Carduus, Helianthus, Solidago* and *Grindelia*

3. **Bombias auricomus** Robertson. (=*pennsylvanicus* Cresson, ♂, ♀, ☿, in part.)

Probably the entire State, but rare westwardly, and not yet taken in Sioux County. Many specimens from Lincoln, Omaha, South Bend, West Point, etc., and a single worker from Dundy County in June on *Carduus* (M. H Swenk). Next to *separatus* this is our most common *Bombias*. The females begin to fly in early May and from then to early October, visiting the flowers of *Ribes, Astragalus, Fragara, Rubus, Antirrhinum* and *Carduus*.

4. **Bombias nevadensis** (Cresson).

This is essentially a species of the Transition zone, but it straggles south along the western edge of the State to Dundy County, and east along the northern edge to West Point. It abounds in Sioux County, flying from May to September, visiting commonly the flowers of *Astragalus, Malvastrum, Cleome, Monarda,* etc. Cresson's *Bombus improbus* is undoubtedly the male of *nevadensis*.

5. **Bombias morrisoni** (Cresson).

A strictly Transition species, only rarely descending even to the more elevated portions of this State. We have two worker specimens, one taken in Warbonnet Canon, Sioux County, July 21, the other at Gering, Nebraska, in August.

6. **Bombias rufocinctus** (Cresson).

Sioux County (Glen, Harrison, Pine Ridge), July and August, 3 females, 11 workers and 1 male. Also a single male from West Point, Nebraska.

7. **Bombias edwardsii** (Cresson).

A worker bumblebee captured in Warbonnet Canon, Sioux County, July 23, 1901 on *Verbena* (M. A. Carriker), is apparently a variety referable to this species, though not typical of it.

Genus **BOMBUS** Latreille.

1. **Bombus proximus coloradensis** Titus.

Warbonnet Canon, Sioux County, July 1, 1901 (L. Bruner), one female specimen.

2. **Bombus pennsylvanicus** (De Geer). (=*fervida* Fabricius.)

Present over the entire State, but common only in the higher parts, especially in Sioux County, where it is abundant from the middle of May to the middle of September. Eastward, it has been captured at Lincoln, Omaha, Weeping Water, West Point, Neligh, Springview and Gordon. It has been taken principally on *Astragalus, Rubus, Petalostemon, Monarda, Mentha, Carduus, Solidago* and *Helianthus.*

3. **Bombus americanorum** Fabricius.

Distributed as *Bombias auricomus,* which it so much resembles but everywhere more common, probably our commonest *Bombus.* Lincoln, Omaha, South Bend, Cedar Bluffs, Weeping Water, Nebraska City, West Point, Neligh, Broken Bow and Brown, Rock and Hitchcock Counties. Not yet captured in Sioux County. Season as that of *Bombias auricomus.* Our plant records for this species include *Astragalus, Rubus, Malus, Petalostemon, Verbena, Carduus, Cassia, Psoralea, Monarda Solanum, Vernonia, Solidago, Carduus* and *Helianthus.*

4. **Bombus virginicus** (Olivier).

Eastern Nebraska, common. Specimens are from Lincoln Omaha, South Bend, Cedar Bluffs, Weeping Water, Meadow, Nebraska City, Falls City and Nemaha City. This is the first *Bombus* to appear in the spring, flying about April 20 on *Prunus* and *Ribes.* Later it is found commonly on *Rubus Cassia* and *Petalostemon.*

5 **Bombus ridingsii** Cresson.

South Bend and Omaha, May 17 20 on *Rubus occidentalis* several female specimens. We have never taken workers or males in the State.

6 **Bombus consimilis** Cresson.

Entire State, specimens from Lincoln, Omaha, South Bend, Weeping Water, Meadow, Cedar Bluffs, West Point, and Sioux County. Found principally on *Rubus, Lonicera* and *Petalostemon* All of our old Nebraska records of *B. vagans* refer to this species.

7. **Bombus huntii** Greene (= *ternarius* of authors, in part.)

This handsome species is confined to the Pine Ridge country in Sioux County, where it flies abundantly from late May to September, visiting *Astragalus, Symphoricarpos, Campanula, Borago, Melilotus, Monarda, Cleome, Carduus* and *Helianthus.*

8. **Bombus juxtus** Cresson.

Distributed as *B. huntii,* but much less common, having the same season and visiting the same plants.

Genus **PSITHYRUS** Lepelletier.

1. **Psithyrus variabilis** (Cresson).

Our commonest *Psithyrus.* Lincoln, Ashland, Seward and West Point, May to October, found on *Rubus, Verbena, Liatris, Bidens, Solidago* and *Carduus.*

2. **Psithyrus laboriosus** (Fabricius).

Two specimens, a female from Lincoln taken in August, 1893, and a male from West Point taken September 19, 1887. This species is much closer to *P. latitarsus* Morrill than is *P. insularis,* with which he compares it.

3. **Psithyrus insularis** (F. Smith).

Found only in Sioux County, from which we have a female and two male specimens.

Family MELECTIDAE.

Genus **NEOLARRA** Ashmead.

1. **Neolarra verbesinae** Cockerell.

One ♀ specimen, Warbonnet Canon, Sioux County, Nebraska, July 23, 1901, on *Helianthus* (M. Cary).

Genus **NEOPASITES** Ashmead.

1. **Neopasites illinoiensis** Robertson.

Lincoln, West Point, Cedar Bluffs and Omaha, Nebraska, June 20 to September 11, on *Solidago rigida* and *Grindelia squarrosa* in the fall, and on *Ratibida columnaris, Symphoricarpos occidentalis* and *Asclepias* sp. in the summer. This species has been found in the nests of *Calliopsis andreniformis* at both Omaha and West Point.

2. **Neopasites heliopsis** Robertson.

Lincoln, West Point, Springview and Warbonnet Canon, Sioux County, Nebraska, June 21 to September 11, on *Solidago rigida*, *Grindelia squarrosa* and *Aster* in the fall, and on *Senecio* in the summer.

3. **Neopasites robertsoni** Crawford.

I took several specimens of this species August 27, 1902, on *Solidago rigida* along with *N. heliopsis*, which was much more abundant. Mr. Crawford records it from West Point, August 30, 1903 on the same flower.

Genus MELECTA Latreille.

1. **Melecta interrupta** Cresson.

Warbonnet Canon, Glen, Long Pine and West Point, Nebraska, June 30 to August 16 at flowers of *Cleome serrulata*, *Petalostemon violaceus* and *Monarda* sp.

2. **Melecta miranda** Fox.

The preceding species is characteristic of the Transition zone and is replaced in the Upper Sonoran by this species. Lincoln, Weeping Water, Glen and Gering, Nebraska, season and flowers the same as for *interrupta;* also found occasionally upon flowers *of Helianthus annuus.*

Genus BOMBOMELECTA Patton.

1. **Bombomelecta pacifica** Cresson.

Warbonnet Canon, Monroe Canon and Halsey, Nebraska, May 28 to June 6, flying at flowers of various species of *Astragalus.*

VIERECKELLA new genus.

Labial palpi 4-jointed, as long as glossa, two basal joints long and flattened, two distal joints short and sub-cylindrical; proportionate length as 10.5: 6: 1.7: 1. Maxillary palpi 5-jointed, the first four joints elongate and cylindrical, the basal joint thickest, joint 2 slightly more slender and much longer, joint 3 subequal to but more slender than 2, 4 about two-thirds as long as 3, joint 5 extremely minute, visible only upon close microscopic scrutiny. Glossa long, one and one half times as long as the mentum, lanceolate. Mandibles with a deep external tooth, inserted before middle of eye. Marginal cell at apex rounded, widely separated from costa, nearly as long as the combined three submarginals but distinctly shorter than the first discoidal cell. Submarginals three, subequal in length along the cubitus, first one trapezoidal, second slightly narrowed above, third narrowed about one-third. First transverse cubital nervure straight, second slightly curved, third bulging strongly out toward apex of wing. First and second recurrent nervures joining second and third submarginal cells respectively near their apices. Median cell much larger and nearly twice as long as the submedian. Discoidal nervure much longer than the sub-discoidal nervure. Stigma medium-sized, well developed. Scutellum bilobed. Legs stout, simple. Claws with a short inconspicuous internal tooth. Tibial spurs short and stout, only one on middle tibiæ, dark testaceous and microscopically pectinate. Abdomen short, conical, segment 6 of ♀ exerted, elongate acuminate, with a distinct pygidial area.

Viereckella obscura n. sp.*

♀.—Length 10 mm.; shining black, nearly bare. Head coarsely punctured, very shallowly on clypeus and cheeks, deeply so on front, the sides of vertex finely punctured. Supraclypeal area elevated, continuous with a median carina between bases of antennæ. Antennæ black, scape finely punctured, the flagellum testaceous beneath, joint three decidedly shorter than four. Labrum shining, punctured like the front. Mesonotum shining, coarsely and closely punctured, no well-defined discal space, scutellum and pleura similarly but more coarsely punctured, postscutellum opaque, irregularly reticulate. Metathorax with a smooth, shining, almost impunctate basal triangle, elsewhere punctured like mesonotum. Tegulæ large, shining black, finely punctured. Wings heavily darkened, nervures and stigma black. Basal abdominal segment subimpunctate, except laterally, following segments feebly and mostly indistinctly punctured, the margins of the segments not depressed. Pubescence short, sparse, pale grayish white, except that on tibiæ and tarsi, which is largely black, and that on the inner surface of the tarsi which is orange, longest on pleura, scutellum and postscutellam. The abdomen has very loose thin lateral fasciæ on apices of segments 1-5, and segments 4-6, bear some black bristles ventrally.

♂.—Unknown.

*A second species of the new genus occurs in Virginia.

Type—Meadow, Nebraska, July 14, 1905. (P. R. Jones) ♀.

In Ashmead's tables this bee runs to *Aglae* Lep. or *Leiopodus* Smith. To the former it is but distantly related, but to the latter it is fairly close, differing radically, however, in the comparative lengths of the palpal joints. From the type specimens of *Leiopodus* this species differs in the lack of depression on mesonotum, dark wings, lack of abdominal maculæ, etc. I take pleasure in dedicating this remarkable new genus to Mr. H. L. Viereck, in recognition of his valuable contributions to the study of North American bees.

Viereckella ceanothina Ckll., n. sp.

♀.—Similar to the typical species, but smaller (length less than 8 mm.); wings only moderately dark, darkest apically, second submarginal cell small, subtriangular, being much narrowed above, very much shorter above and below than the first or third; flagellum beneath dark coffee brown, except its first joint, which is red; hair of tibiæ white. Runs nearest to *Leiopodus* in Ashmead's table. I examined the type of *Leiopodus* in the British Museum (see Trans. Am. Ent. Soc. XXXI, 310) and it is a decidedly different insect. The hind coxæ are large and long, while in our insect they are normal, though rather large; the b. n. falls a considerable distance short of t. m.; in our species they meet. The shape of the second s. m. is entirely different.

Habitat.—Falls Church, Va., June 14, at flowers of *Ceanothus* (*Nathan Banks*). T. D. A. COCKERELL.

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Lycaena emigdionis Grinnell. Mr. Fordyce Grinnell described (ENTOMOLOGICAL NEWS, April, 1905) a male and female of a *Ly*[illegible] which he called *emigdionis*. His specimens were taken in San E[illegible] Canon, Kern County, California, in June. Mr. W. G. Wright in Butterflies of the West Coast, page 230, redescribed the species, giving it the name *melimona* "from both of its supposed parents" (*melissa* and *acmon*). All his specimens were females and were taken in one locality in the San Bernardino Mountains in June. He found *acmon* present there in May, *melimona* in June, and *melissa* in July. The larval food-plant of *emigdionis* is *Hosackia purshiana*. Specimens sent by Mr. Wright to W. H. Edwards were said to be "only a variety of [illegible] He [illegible] the male. A later examination of Mr. Grinnell's specimens proves them to be all females, and, as Edwards said, *emigdionis* is probably only a variety of *acmon* and the synonymy will be: *Lycaena acmon* Boisd. Var. *emigdionis* Grinnell, *melimona* Wright.—CARL R. COOLIDGE.

Notes on Histeridae.

By Charles Schaeffer, Brooklyn, N. Y.

Hololepta pervalida Blaisd.

This is a valid species and distinguishable from all the North American as well as the Mexican species of the subgenus *Liodermа*, as far as known to me, by the possession of a transverse marginal line at base of elytra. This impressed line is a continuation of the two striæ along the basal margin and generally extends to the scutellum. The form is narrower and more parallel than *yucateca;* the apical fovea of the thorax in *yucateca* is very near the apical angles, while the fovea in *pervalida* is separated from the apical angles by twice or three times the width of the side margin, the space between the fovea and the apical angle with confused, short striæ. The median ridge of the underside of the front tibiæ is smooth and not interrupted in *yucateca*, but is interrupted, or rather three—or four—dentate in *pervalida.*

Mr. George Franck received a great number of specimens from Pasadena, which I take to be this species. The description is very poor, hardly anything is given to differentiate this species from *yucateca*, except that it is said to be "strongly oblong, narrower and much less depressed than *yucateca*," which applies well to the Pasadena specimens, but also to *grandis* Mars., which Marseul himself placed as a synonym of his *yucateca.* In the description of *grandis* there is, however, no mention made of the transverse marginal stria at base of elytra, which could not have been overlooked.

Major Casey, who seems to have seen the type of *princeps* Lec., states that this is a distinct species, but gives nothing to differentiate it from *yucateca* Mars. It may be that *pervalida* is the same as *princeps,* in which case the latter name has to be used for this species.

I found *Hololepta yucateca* near Brownsville, Texas, in the decaying trunks of *Yucca treculeana; vernicis* in the decaying flower stalks of *Agave americana?* in the Huachuca Mountains, Arizona, and *cacti* in the half-decayed leaves or rather stems of *Opuntia engelmanni* near Brownsville and Hidalgo, Texas.

Hololepta vernicis Casey.

In the Huachuca Mountains, Arizona, I took a small number of specimens of a *Hololepa*, which agree in every respect with the description of this species. It is also a good species and not synonymous with *yucateca*. The specimens are always much smaller than *yucateca*, about the size of *cacti*, but more elongate; the lateral thoracic groove is narrow and deeply impressed, and scarcely becomes wider near apical angles; near the latter in the male is a deep circular fovea, which is absent in the female; the supra-orbital striæ are in all my specimens short, basal. The description of the Mexican *polita* Mars. fits the males of *vernicis* Casey very closely, in fact, there is hardly anything in the description which does not agree with my Arizona specimens, except that the subhumeral stria does not extend quite to the base in my specimens. The two will have to be united if there are not other characters present to separate them.

Hololepta (*Liodermа*) **beyeri** new species.

Male. Form and size of *cacti* Lec., but slightly narrower, black, shining. Mandibles elongate, feebly curved at apex, suddenly dilated inside at about basal third, above the dilatation, one obtuse tooth, surface finely punctulate. Head sparsely, rather coarsely punctate with some finer punctures intermixed, antеocular tooth indistinct, supra-orbital striæ distinct. Thorax deeply emarginate at apex and [illegible] arcuate, lateral [illegible] deeply impressed but not broad, continued [illegible] basal [illegible] short distance, at sides slightly below apical [illegible] a deep [illegible] groove, above and below this a smaller one [illegible] two are [illegible] connected with each other by the marginal [illegible] near [illegible] angle, the surface is moderately [illegible] punctate [illegible] with an impressed median line which [illegible] not extend to apex. Elytra as broad as the thorax at base, subhumeral groove deeply impressed not extending to base nor apex, [illegible] sparsely punctate [illegible] dorsal stria short basal deeply impressed below [illegible] or less distinct fine punctures [illegible] deeply [illegible] around which are a few coarse punctures [illegible] apex. [illegible] coarsely punctate, punctures [illegible] apex, pygidium more densely [illegible] arcuate on each side [illegible] middle. Prosternum convex, [illegible] in front of anterior coxæ, acute at apex [illegible] dilated [illegible] behind. Anterior and middle tibiæ quadridentaposterior tridentate, teeth of middle and hind tibiæ long and acute, except the basal tooth on middle tibiæ, which is small. Length, from apical margin of thorax to apex of elytral suture, 8.5 mm.

Habitat.—Santa Rosa, Lower California.

I take great pleasure in dedicating this interesting species to my friend, Mr. Gustav Beyer, to whom we are indebted for this and many other additions to our fauna.

The lateral transverse grooves of thorax and the basally dilated mandibles distinguish this species from any of those known to occur within our fauna. The Mexican *dorcoides* has the thorax similarly grooved, but the mandibles have a blunt tooth at base and are serrulate inside, while in *beyeri* the mandibles are broadly dilated at base with one obtuse tooth above the dilatation, the apical part of the inner edge above the tooth is smooth, showing no sign of irregularity in any of the specimens examined.

The presence of a supra-orbital stria, which is used by Dr. Horn in his synoptic table in separating *yucateca* and *cacti* from the rest of our species is in these fairly constant, but is variable in length in *pervalida* and short, basal in *vernicis,* but also visible at base in *quadridentata* and *vicina,* while in *fossularis, lucida* and *populnea* not the slightest trace can be found. The three last mentioned species have above each eye an almost semi-circular, fovea-like distinct impression, the form is more depressed and the prosternum broad and flat. They belong to *Hololepta proper,* while the rest of our species belong to the subgenus *Lioderma.* These latter have instead the fovea-like impression, a slightly depressed, coarsely punctured space above each eye, from which the supra-orbital striæ start.

Th labrum in *quadridentata* is said to be carinate, which is not quite correct. The greatest part of the labrum at middle is deeply depressed, especially in front, consequently the sides being more elevated, from a certain point of view, give the appearance of being carinate on each side.

Table of the Species of **Hololepta.**

First and second elytral striae continued along basal margin forming a basal stria, which generally extends to the scutellum. **pervalida** Blaisd.

Elytra without transverse marginal striae at base 2

1. Pygidium distinctly margined ; labrum longitudinally carinate on each side ; lateral margin of thorax generally interrupted at middle but grooved or foveate except near apical angles in the male **cacti** Lec

Pygidium not margined 3

3. Thorax near side margin, slightly below apical third, deeply transversely grooved, above and below this a smaller, but deep impressed fovea, the one about middle, connected with the median groove by the marginal groove ; mandibles more or less suddenly dilated at about basal fourth and with a more or less distinct tooth above the dilatation ; labrum obtusely carinate on each side ; prosternum strongly carinate in front broadly dilated behind . . . . **beyeri** n sp

Thorax near side margin below apical third not grooved, mandibles not dilated at basal fourth 4

4. Head on each side above each eye with a fovea-like distinct impression ; no supra-orbital striae 10

Head on each side above the eyes feebly depressed, coarsely punctate and with a more or less distinct supra-orbital stria, which in some species greatly abbreviated and visible at base only 5

5. Labrum longitudinally carinate on each side ; outer carina of underside of middle and hind tibiae denticulate . . . 8

Labrum not carinate, outer carina on underside of middle and hind tibiae not denticulate 6

6 Median carina on underside of front tibiae without, or with one, tooth-like elevation at apical fourth 7

Median carina of underside of front tibiae with several tooth-like elevations at apical half . . . 9

7 Thorax at apical margin, on each side of the emargination, with a short impressed transverse line ; sides of thorax near margin groove not punctate ; lateral groove of thorax relatively broad, strongly widening towards apex and terminating here in a more or less distinct fovea-like impression in both sexes **yucateca** M

Apical margin of thorax without short, impressed line on each side of emargination ; sides of thorax near lateral margin moderately coarsely punctate from base to apex ; lateral groove of thorax narrow deeply impressed and of nearly equal width throughout, terminating in a very deep, rounded fovea in the male, the fovea absent in the female ; supra-orbital stria short, basal . . . **verticis** C

8 Median carina on underside of front tibiae feebly dentate near apical fourth ; supra-orbital stria short, basal ; head without frontal stria ; elytra with inner stria entire, outer short, basal ; supra-orbital stria short, basal . . . . **quadridentata** Fab

9. Head in front with two arcuate impressions, which are sometimes connected; thorax punctate at sides; elytra with inner stria entire, outer short, basal; supra-orbital stria short, basal. **vicina** Lec.

10. Elytra with outer stria entire, inner short basal; prosternum feebly convex, broadly arcuate in front . . . . **lucida** Lec.

Elytra without entire striae; prosternum flat, broad and truncate at apex . . . . 11.

11. The two striæ on each elytron, short, basal, the inner without apical appendage . . . . **fossularis** Say.

The inner elytral stria with apical appendage, the outer short, basal. **populnea** Lec.

Hololepta neglecta Blaisd., described in Zoe, Vol III, p. 338, is unknown to me and not included in the above table, as nothing tangible could be found in the poor description to differentiate this from the allied species.

Omalodes grossus Mars. (*texanus* Mars , *lubricans* Casey.)

The principal difference between *grossus* and *lubricans* consists in the punctuation of the pygidium and propygidium, which are in *grossus* coarsely punctuate at sides only, while in *lubricans* the entire pygidium is coarsely punctuate, except in anterior third and the punctured space on each side of the propygidium connected at apex by some very fine punctures. The five specimens before me show all grades of variation in the punctuation of the two pygidia from *grossus* (Huachua Mountains, Arizona) to *lubricans* (Sta. Rita and Huachuca Mountains, Arizona).

Omalodes texanus Mars.

Is principally separated from *grossus* by having the two punctured areas at sides of the two pygidia connected at apex and the hind tibiæ tridendate. The first character, as shown above, is not constant, and an examination of the ten hind tibiæ of the five specimens before me reveals the interesting fact that the number of teeth is not alone variable, but that even in the same specimen one of the hind tibia may be tridentate and the other quadridentate, also that the distance between the first and second and second and third tooth varies greatly on the two tibiæ of the same specimen In my opinion there is very little doubt that *texanus* also has to be placed as synonym of *grossus*. The more elongate form mentioned by Marseul as another character distinguishing the species from *grossus* seems to me purely sexual, the figures given by him of the two species do not show such great difference in form as one might expect from his description.

I found this species in the Huachuca Mountains, Arizona, in the decaying flower stalks of *Agave americana*.

* * *

Notes on Papilio ajax.

By R. R. Rowley, Louisiana, Mo.

The chrysalids of *Papilio ajax*, from larvæ fed in confinement in the summer of 1905, and kept over winter in a d[illegible] box in a closet opening into a warm room, began giving imagoes April 12th, and between that date and May [illegible] seventy-nine butterflies emerged, three or four only of the original number of pupæ dying in the pupal skins. But few of the of the imagoes were deformed, and these cases were largely due to pricking the wings before their unfolding. The greatest number of "flies" emerging at one time, twenty-two, was April 22d, but from lack of proper attention in removing the pupæ about to "hatch" to different boxes, so that there would be few of the imagoes together, not many of this number were worth keeping, being badly battered and torn, although the cages were in a dark closet.

It is my custom in setting bred specimens to give the imago as long a lease on life as possible before putting it in the cyanide jar, else the wings may be too limp and the b[illegible] collect in blisters and spoil the specimen.

After the wings of a butterfly are fully expanded it is f[illegible] hours or more before the insect has strength enough to fly well, and it is best to allow your specimen so much time before you kill it.

In the case of moths, after emergence, it is well to keep the cage in the light (not direct sunlight) and, as they usually "hatch" in early morning, allow them all day to fully develop, transferring them to the cyanide jar late in the afternoon, not evening, as that is their time of flight.

As stated in the article on *ajax* in the May, 1906, number of THE NEWS, the larvæ that gave me over a hundred chrysalids were gathered from June 1st to October 1st, few of the number emerging from July to October. Why so few of the chrysalids gave butterflies during the summer and autumn is a little strange, but doubtless a wise provision of nature to prevent the extinction of the species.

Another interesting observation on these *ajax* pupæ is that every one of the seventy-nine spring imagoes are of the winter varieties, despite the fact that many of them should have given summer forms last year, and all of them escaped a freezing temperature last winter.

In a majority of the specimens of the winter forms of imago, the ground color is from a pale cream on the hind wing to a light blue-green on the front wing, with cross bands of dark brown or black and a double red spot at the anal angle, separated from the two blue lunules by a cream-colored spot. In a few specimens the double red spot gives place to two separate spots. In a number of the imagoes the usual pale blue-green ground color of the front wing is replaced by a very light or pale smoky yellow.

A few specimens have the outer border of the forewing full or convex.

In specimens of the so-called variety *abbottii*, a more or less distinct crimson streak occurs on the upper side of the hind wing near the middle and just outside of the medial black band.

In one specimen this red is a distinct spot with an outer black shade line. On the first day of May, 1906, I collected twenty-three eggs and three young larvæ of *ajax*. So backward had been the spring that few of the leaves had at all opened out, and so the eggs were found on the lower side, exactly the opposite of the finds last summer and autumn. As before, they were found largely on the low, young shrubs. On May 18th, I had the first two pupæ of the summer brood, one green and one brown. Seventeen days from the emergence of the last winter imago I had the first pupæ.

After collecting the above eggs, a series of killing frosts left all exposed papaw bushes without leaves or blooms, and doubtless killed the young larvæ as well.

Of the twenty-three eggs and three small larvæ collected May the 1st, sixteen were brought to pupation, the chrysalids being of the following colors and numbers: 5 green, eight light brown, 2 red and 1 yellow. The proportional number of green ones is much greater in the first (spring) brood than in the later ones.

Throughout May and June other eggs and larvæ were collected, and the first *marcellus* imagoes from chrysalids were given June 7th. Each day thereafter to the 17th, gave a few butterflies. Stragglers continued to emerge through July, perhaps half a dozen in all. Then there seemed to be an end to the "hatching."

On September 1st another *marcellus* imago was found in th box.

There were left over sixteen pupæ from the May and Jun eggs and these are at this writing giving winter forms o imagoes.

* * *

Preparing Lepidoptera for the cabinet in short orde

H. H. BREHME, Newark, N. J.

It has been the custom of collectors of Lepidoptera u to the present time to spread their specimens and let ther remain on the spreading boards all the way from two to s weeks.

First of all, a collector needs a lot of spreading boar and plenty of space to store them, which is inconvenient many if not all collectors of Lepidoptera. This is not all many of the specimens get destroyed while on the boar boring the bodies either by mice or by destructive insects

I also found, as other collectors undoubtedly do, that n matter how long a once papered specimen remains on th board after being relaxed, it will always spring back again a short time, and to get it in proper shape it will have t relaxed again, making double the work. I have bee making experiments for three years in baking the specimen on the board and find it a great success.

I am now glad to let the Lepidopterists know all ab it, and they can undoubtedly save a good many specimens by following directions.

Relax the specimens well and then place the same on the board with narrow strips of tracing cloth. When the board is filled lay a strip of paper over the specimens, then cover the paper with strips of glass about one-fourth of an inch in thickness. After this is all done place the specimens in a cooking-stove oven. If the stove is red hot, ten minutes will be sufficient, if the stove is not so hot it will require from twenty to thirty minutes. The best way to test is to touch the glass with the finger; if the glass is so hot that the finger cannot remain longer than a second the specimens are done, and can be put away to cool off.

The specimens can be taken off the boards two hours after coming out of the oven. To make sure about papered specimens it is advisable to give them two bakings: bake them for ten minutes and let them cool for two hours and then put them in the oven again for another ten minutes.

With freshly hatched specimens the heat should not be so great and the door of the oven left open. The specimens should be kept in about one hour in *not* too hot an oven.

If too much heat is put on fresh specimens at once it will shrivel up the bodies.

There is absolutely no danger of the specimens being destroyed. I had boards full of specimens in the oven so long that the spreading board burned and the glass was so hot that it cracked. After the board and glass had cooled off the latter was removed and the specimens were found in perfect condition.

This will be a great help to collectors of Geometridæ, as these species will always sag the wings when prepared in the usual way; but if the specimens are baked properly they will never sag or spring back. This method will save both time and spreading boards, as the specimen can be placed in the cabinet the same day on which it is spread, and will remove all danger of specimens being destroyed while on the boards, and no re-spreading will be required.*

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* This method is not new.—EDS.

A new Geometrid Moth from California.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

In Dr. Hulst's Classification of the Geometrina of North America he instituted the genus *Enchoria* describing at the same time as the type a Californian moth under the name *Enchoria osculata*.

This is a very distinct, and I think, a rather rare spec[illegible] I saw several not long ago in the cabinet of Mr. H. H. Lym[illegible] of Montreal. They had been collected in Southern Califor[illegible] by Morrison, and Mr. Lyman very kindly gave me one [illegible] them for my own cabinet. *E. osculata* might just as well [illegible] placed in *Hydriomena*, and I question whether the gen[illegible] *Enchoria* is worth retaining.

In Dr. Hulst's latest list of Geometrids (in Dyar's cat[illegible]logue) he associated a second species with *E. osculata*, und[illegible] the name *Enchoria albifasciata* Packard. This (judging fr[illegible] the reference given) is intended to be the *Hypsipetes albifa*[illegible] *ata* which Packard described in the Sixth Report of the Pe[illegible] body Academy of Sciences (1874), page 41, and which h[illegible] previously been figured on Plate I, Vol. XVI of the Proc[illegible] ings of the Boston Society of Natural History.

The description is repeated in the Monograph, page 67 a[illegible] a figure of a typical specimen is given on Plate VIII, Fig [illegible] but in this publication Packard treats the insect as a variety [illegible] of *Hydriomena sordidata*.

I have always been puzzled to know how Hulst came to asso[illegible] ciate together two such dissimilar insects, but recently I h[illegible] found an explanation. Mr. Grossbeck has kindly sent me [illegible] photograph of the insect standing in Hulst's collection [illegible] *E. albifasciata*, and it appears that it is not Packard's spec[illegible] at all, but an undescribed species which I should prefer [illegible] place in the genus *[illegible]*.

Before describing this moth let me point out that that Pack[illegible] ard's species is so well described and figured that there can [illegible] no doubt as to the form he had before him. I have spec[illegible] from San Luis Obispo, California, and am inclined to give [illegible] moth specific rank, but in any case it is not a variety of [illegible] *data*. It is very close to *H. reflata* Grote, and if the two are not distinct then it is *reflata* that must be dropped as a synonym of *albifasciata*.

The *albifasciata* of the Hulst collection I will describe as follows :

Mesoleuca hulstata new species.

=*Enchoria albifasciata* Hulst as of Packard, not *Hydriomena albifasciata* Packard.

Palpi rather large and stout. Head and thorax gray with many brown and a few black scales. Thorax tufted slightly both anteriorly and posteriorly, the tufts in each case being apparently double. Abdomen of female very short, of the same color as the thorax, except the terminal segment which is wholly white; each brown segment is edged behind with a fine white line. Fore wings with the basal two-fifths brown, like the thorax, with darker lines. At the extreme base is a conspicuous dark spot on median vein ; basal line curved, followed by a dark band, limited outwardly by an acutely scalloped line ; next is a paler band followed by another dark one, which is bounded on both sides by still darker wavy lines. The outermost of these lines (which is the intra-discal line) is sometimes edged within with whitish. The discal space is pure white, narrowest at the costa, widening out opposite the discal spot (which is round, black and conspicuous) and narrowing again to the inner margin when the moth is at rest and the inner margin of the fore wing is laid parallel to the abdomen, the white terminal segment of the latter exactly corresponds with the white median space of the wing. The extra discal band is brown, darker towards the costa and limited outwardly by a distinct wavy line which runs inwardly towards the discal spot, between veins 5 and 6, making a conspicuous sinus as in *Mesoleuca hersiliata*. The extra discal band is followed by a more or less distinct white line sometimes wide enough to be styled a band ; from this, between veins 3 and 4, a whitish patch extends to the outer margin of the wing. Submarginal space dark brown, divided by an interrupted white scalloped submarginal line. The scallops between veins 4 and 5, 5 and 6, and 6 and 7 are marked on both sides of the line by dark brown spots. There are similar spots between veins 1 and 2 and 2 and 3. Marginal line brown, broken into dots. Fringe pale, basally with darker median line and spots opposite the ends of the veins. Hind wings almost clear, though in my freshest specimen there is a brown clouding at the apical angle and slight indications of 2 dusky submarginal lines. Marginal line and fringe as on fore wings. Underside lightly scaled with very faint reflections of the markings of the upper side, the indented extra-discal line and the discal spots on all wings being most evident. Expanse 25-30 mm.

Described from 7 females received from Claremont, California, through the kindness of Prof. C. F. Baker. There is one male from the same locality which differs in being much darker and in having the central white band reduced to a white blotch surrounding the discal spot, with 2 or 3 white ringlets below. I am not sure, however, that this insect is the proper partner of the females described above. In general appearance this species resembles a pale specimen of *Hydriomena basaliata* Walker (western form), but the conspicuous white median band is distinctive.

List of 110 species and varieties of Butterflies taken by the Members of the St. Louis Entomological Club, in the vicinity of St. Louis, Missouri.

BY HENRY MCELHOSE AND HERMANN SCHWARZ.

Danais plexippus, Linn. Abundant.
Agraulis vanillae, Linn. Rare.
Euptoieta claudia, Cram. Common Sept. and Oct.
Argynnis diana, Cram. 1 male at Pevely, 27 miles south of St. Louis.
" *idalia*, Dru. Rare.
" *cybele*, Fabr. Common.
Phyciodes nycteis, Db.-Hew. Common.
" *ismeria*, Db.-Lec. Rare.
" *tharos*, Dru. Common.
" " var. *morpheus* Edw. Common.
" " var. *packardii* Scud. Rare.
" " var. *marcia* Edw. Rare.
Melitaea phaeton. Rare.
Grapta interrogationis Fabr. Common.
" " var. *fabricii* Edw. Scarce.
" " var *umbrosa* Lint, Common.
" *comma* Harris. Common.
" " var. *harrisii* Edw. Common.
" " var. *dryas* Edw. Scarce
" *progne* Cram. Scarce.
" *j-album* Bd.-Lec. Very rare.
Vanessa antiopa Linn. Common
" *milberti* Godt. Very rare.
Pyrameis atalanta Linn. Common.
" *huntera* Fabr Common
" *cardui* Linn. Common.
Junonia coenia Hub Common.
Limenitis ursula Fabr. Common.
" *archippus* Cram. Common.

Apatura celtis Bd.-Lec. Common.
" *clyton* Bd.-Lec. Moderate.
" *flora* Edw. Very rare.
Anaea andria Scud. Common.
Debis portlandia Fabr. Common.
Neonympha eurytris Fabr. Very common.
Satyrus alope Fabr. Very rare.
Libythea bachmani Kirtl. Scarce.
Thecla m-album Bd.-Lec. Scarce.
" *melinus* Hbn. Scarce.
Thecla calanus Hbn. Common.
" " var. *lorata* G. and R. Rare.
" *liparops* Bd.-Lec. Rare.
" *damon* var. *discoidalis* Skinner. (1 specimen Meramec Highlands, April).
" *cecrops* Fabr. Common.
" *irus* Godt. Common.
" *titus* Fabr. Scarce.
Feniseca tarquinius Fabr. Moderate.
Chrysophanus thoe Bdv. Scarce.
" *hypophlaeas* Bdv. Common.
Lycaena pseudargiolus Bd.-Lec. Common.
" " var. *violacea* Edw. Common.
" " var. *marginata* Edw. Scarce.
" *comyntas* Godt. Common.
" *isola* Reak. Scarce.
Pieris protodice Bd.-Lec. Common.
" " var. *vernalis* Edw. Scarce.
" *rapae* Linn. Common.
" " var. *immaculata* Sk. Scarce.
" " var. *novangliae* Scud. Scarce.
Nathalis iole Bdv. Common.
Anthocharis olympia var. *rosa* Edw. Scarce.
" *genutia*, Fabr. Common in spring.
Catopsilia eubule Linn. Common.
Colias caesonia Stoll. Common.
" " var. *rosa* McNeil. Moderate.
" *eurytheme* Bd.-Lec. Moderate.
" " var. *ariadne* Edw. Common.
" " var. *keewadin* Edw. Common.
" " var. *eriphyle*. Rare.
" " var. *albino*.
" *philodice* Godt. Common.
" " var. *albino*.
Terias mexicana Bdv. Moderate.
" *nicippe* Cram. Common.

Terias lisa. Common.
Papilio ajax var. *walshii* Edw. Moderate.
" " var. *telamonides* Feld. Scarce.
" " var. *marcellus* Edw. Moderate.
" *philenor* Linn. Common.
" *polyxenes* Fabr. Common.
" *troilus* Linn. Common.
" *turnus* var. *glaucus* Linn. Scarce.
" *cresphontes* Cram. Moderate.
Ancyloxypha numitor Fabr. Common.
Pamphila zabulon, Bd.-Lec. Common.
" *hobomok* Harris. Common.
" " var. *pocahontas* Scud. Common.
" *campestris* var. *huron*.
" *phylaeus* Dru. Scarce.
" *otho* S. and A. Scarce.
" *peckius* Kirby. Common.
" *manataaqua* Scud. Rare.
" *cernes* Bd.-Lec. Common.
" *verna* Edw. Common.
" *metacomet*. Moderate.
" *fusca* G. and R. Scarce.
" *ocola* Edw. Rare.
Amblyscirtes vialis Edw. Common.
" *samoset* Scud. Scarce.
Pyrgus tessellata Scud. Very common.
Nisoniades brizo Bd.-Lec. Common.
" *martialis* Scud. Common
" *juvenalis* Fabr. Common.
Pholisora catullus Fabr. Common.
" *hayhurstii* Edw. Moderate.
Eudamus pylades Scud. Common.
" *bathyllus* S. and A. Common
" *lycidas* S. and A. Common.
" *tityrus* Fabr. Common.

◆

The results of a breeding of Apantesis figurata Drury.

By MAX ROTHKE, Scranton, Pa.

On May 30, of the past year, I captured in the Spring Brook Valley near Scranton, Pa., under unusual circumstances that is, in the noon hour, a ♀ of *Apantesis figurata* Drury. From the somewhat abundant eggs, I obtained, through careful breeding, 60 specimens, which, as to markings and coloring of the hind wing varied considerably from each other.

The hind wings of the above-mentioned female were black, with a small round red spot slightly above the center toward the costal margin, while just below this towards the outer margin there appeared a larger fork-shaped red spot. The markings on the forewings corresponded on the whole with the cut, as shown in Holland's Moth Book, plate xv, fig. 12, except that the fore cross stripes were faint, and partly not clearly visible, while the markings in the limbal area of the wings near the outer margin, which are totally absent in Holland's figure, were in the shape of an indistinct triangle arising in the center of the rear cross stripes. The forms which resulted were as follows:

(a) Hind wings red, with a black band at the costal and outer margin, similar to Holland's figure 12, besides having an oblong black spot extending inward from the costal marginal band; this spot, as well as the stripes, in all cases were larger than given in that figure: 1 ♂ and 2 ♀.

(b) The same form, but the ground color of the hind wings yellow instead of red: 4 ♂ and 3 ♀; in two ♀ of this form the yellow shaded slightly into the flesh color.

(c) The markings more or less like the mother, except that the small round spot in the hind wings was plainly marked in a few, some having only a very small dot, while in most cases it was missing altogether. The largest number had the large forked spot very prominent and resembling that of the mother specimen, appearing stronger in some and weaker to the invisible in others; in one example the hind wings being entirely black. The females were more numerous in this case than the males; there being fifteen of the former and twelve of the latter.

(d) The same form, but with yellow instead of red spots: 8 ♂ and 9 ♀; several of this lot also showed the yellow shading into the flesh color and may be taken as middle forms between the red and yellow specimens. I consider the example with the entirely black hind wings as belonging to the yellow form, for the reason that in this, as in all those with the yellow markings, the bands on the forewings are somewhat lighter in color than in the red ones.

Among the total lot of sixty specimens three have either the fore or hind wings shading into the gray, some showing a tendency to albinism, two with the hind wings red and one with yellow.

The larvæ were fed with lettuce from the earliest stage, later I fed most of them with dandelion, a few were fed with lettuce until transformation; both lots, however, resulted in yellow as well as red forms.

The breeding was carried on indoors in a temperature of the ordinary living room and in almost total darkness; no experiment with the chrysalids was attempted. The imagines emerged in the latter part of July and the early part of August. An attempt at further propagation was not successful, the same being the case in 1905, when I sacrificed several specimens for same purpose.

◆

Oviposition of Chrysopa Species.—On August 8, [illegible], at Cumberland, Md., a female *Chrysopa* was observed to alight on a grass [illegible] in a large meadow, and after a few minutes fly from there to a clover leaf. From its peculiar actions, oviposition was suspected. The insect was careful in choosing a position, and the tip of the abdomen was moved up and down. After tentative examination of the surface of the leaf with jaws and tip of abdomen, it came [illegible] upper surface and finally took position on the distal portion of the leaf near the midrib, the head, was in its normal position. The abdomen then began to move up and down, and the [illegible] segments became swollen, giving a knotted appearance [illegible]. After a few seconds, the tip of the abdomen was placed [illegible] the leaf and this was daubed several times with a viscous secretion forming a mat, the base and support of the egg petiole. Resting [illegible] mat of secreted matter, the tip of the abdomen was then slowly raised while at the same time the secretion continued and quickly [illegible] on exposure to the air, becoming visible to the eye. In this way the petiole was formed. Continuing the slow, regular, upward movement of the abdomen, there suddenly came into view a large [illegible] which proved to be the egg. After this was [illegible] the upward movement of the abdomen stopped, and the egg was [illegible] until the secretion had hardened. The egg was [illegible] after the stem or petiole had reached a height of a quarter of an inch.
A. A. Girault.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JULY, 1907.

The Seventh International Zoological Congress will be held in Boston, Mass., from August 19th to 23rd, and will be an event of very considerable moment to those interested in the subject. There will be an Entomological Section and in addition the Entomological Society of America will meet, and the program will be an attractive one. The new entomological society has done wonderful things during its short life, and the membership is large and growing.

The Entomological Club of the American Association for the Advancement of Science was a very weak affair and lacked continuity. The ephemeral character of the offices and officers made it impossible to maintain any proper records. The new society will add strength to the American Association and also bind together the entomologists of America. A great work can be done by the Entomological Society of America if it will encourage and try to build up new entomological societies in the south and west, They in their turn can offer inducements to people to join and take an interest in entomology.

We predict a long life and a most useful career for the new society. The time is not far distant when it will be considered an honor to be a member, and it will be a laudable ambition for entomologists to try and become worthy of fellowships.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE NEWS will not be published for August or September. The next number will appear October 1st (No. 8).

While collecting in Sapello Canyon, New Mexico, some years ago, I made a few notes on the early stages of *Argynnis nitocris nigrocaerulea* Ckll., which may be of some interest until someone works out the complete life history. Eggs were laid August 24th, and were examined September 4th. Probably yellow when laid, pinkish in color, conoidal, flattened at the base and run to a blunt point at the micropyle; well-marked longitudinal ribs, with many transverse ridges between; each ridge is joined at the apex with its fellow. There is a small central opening or depression at the apex. Eggs hatched September 7th. First stage of larva—Head black; body very pale greenish-yellow; eleven rows of green warts, lateral ones bear long setæ. Second stage.—Appearance totally changed; numerous black, shining spines, tipped with coarse black hairs; body yellowish-brown, with numerous single hairs or setæ. The larvæ probably died as the rough notes end here. They were not intended for publication when written.—HENRY SKINNER.

PHENGODES Illiger.—A note on luminous females and larvæ.—For a number of years I have taken, in numbers fairly common at electric lights, during June and July, in McPherson, Kansas, males of *Phengodes*, which prove to be *Phengodes fusciceps* Lec.

The summer of 1905, I heard of two specimens of "glow worms" but failed to secure them. In May and June, 1906, I was so fortunate as to secure two specimens of these "glow worms," and the last of July, a third specimen, and heard of as many more during these months. They were found on the lawns of residences on warm evenings. The first two specimens were of a cream color and opalescent in certain lights. The July specimen (which was probably a larva, and not an adult female) was cream colored on ventral surface and sides, but the dorsal part of each segment was dark brown, shading to black. Of the June specimens, one was larger than the other, the larger being about twenty-eight millimeters when extended and moving and the smaller about twenty-three millimeters in length. The last of July specimen was of the same length as the smaller one of the June specimens but was more slender than either of the others.

They were kept in a tin box with a glass cover. When taken out during the latter part of June and the first half of July in the twilight of warm evenings the males of *Phengodes fusciceps* would appear in numbers. One was observed beating against the wire screen of a door endeavoring to enter the room where the "glow worms" were kept

On opening the screen, it flew in, entered the open box and at once copulated with the larger female. It was confined with the females, but only survived two days. Unfortunately, I was not acquainted with the food of the larviform females, so that during the entire life in confinement, some seven or eight weeks, no eggs were obtained. Of the two females, one was kept from May 20th to July 15th, and the other (to which the male came) from June 1st to July 28th. Had I provided their proper food—myriapods—I believe eggs and larvæ would have been secured.

During the day they remained coiled and inactive; became active at night, and intensely luminous; every segment, spiracle and line, apparently, showing a bead of greenish-yellow phosphorescent light. This luminosity was present in the three specimens in the same degree, but the larger specimen, for a period of five nights, showed not a ray of light. At the end of this period, it again became luminous. This would indicate that the insects controlled the luminosity.

The three specimens are now in the hands of Mr. Herbert S. Barber, of the Smithsonian Institution, who, with Mr. E. A. Schwarz, of the same institution, is engaged in the preparation of a revision of the Phengodinæ.—W. KNAUS, McPherson, Kansas.

Doings of Societies.

At the meeting of the Feldman Collecting Social held on April 14th, 1907, at the residence of H. W. Wenzel, 1523 So. Thirteenth Street, Philadelphia, there were ten members present, President Daecke in the chair. The following gentlemen were elected to membership: H. A. Wenzel, H. A. Kaeber, George M. Green and H. L. Viereck, all of the city of Philadelphia.

Professor Smith said he had received from Mr. F. Weigand, of Philadelphia, an inflated larva and three imagos (two male and one female) of a *Cucullia* new to science, bred by Mr. Weigand. These moths emerged in spring, which is unusual in this genus, the habit of the other species being to emerge in fall.

Mr. Laurent gave a brief account of his trip to Southern Central Florida from January 12th to March 30th, of the present year. He said that no Lepidoptera appeared until March 1st; in all about 400 specimens were collected. Coleoptera were very scarce, and Mr. Laurent suggested that the scarcity of insects was due to the dry season.

Mr. H. W. Wenzel made some remarks on the collection of his son and Dr. Castle, made at Tybee Island, and showed a number of new and interesting species.

Mr. Harbeck reported the capture of *Leptogaster virgatus* Coq. at Trenton, N. J., on July 7th, as new to the New Jersey list.

Mr. Wenzel showed specimens of *Pityophagus cephalotes* Lec. taken at Iona, N. J. April 30th. This species was described from a unique specimen from Pennsylvania, and is not represented in the collection at Washington, nor in the Horn collection. Mr. Wenzel also exhibited some small tubes open at both ends, and charged in the centre with cyanide of potassium, for collecting minute insects.

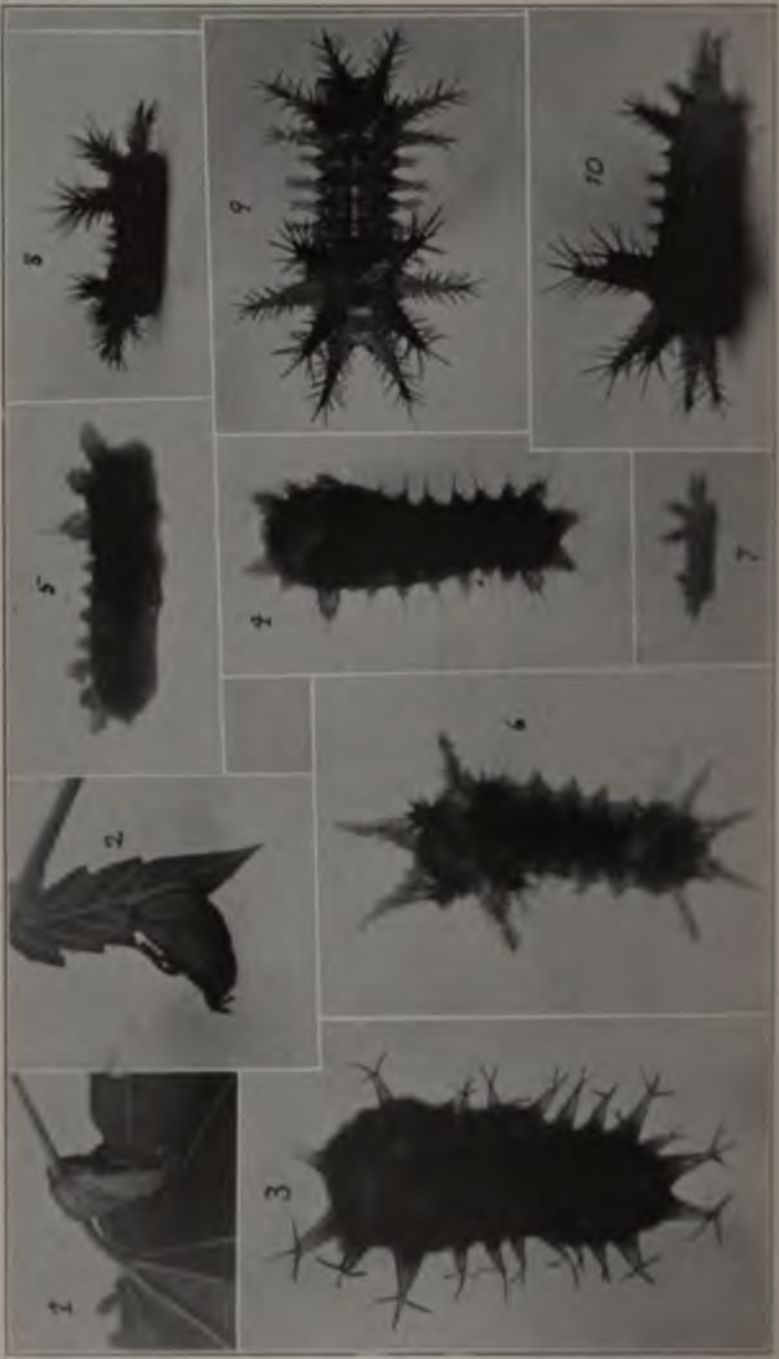
FRANK HAIMBACH, *Secretary.*

H. D. MERRICK.

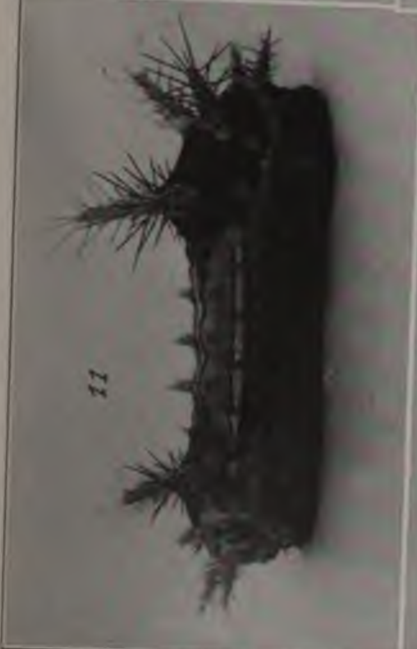
It was with great sorrow and regret that we learned of the death of Mr. Merrick. He had been a student of the Lepidoptera for a number of years, and he and his father, Mr. F. A. Merrick, have a host of friends and correspondents who will greatly feel his loss.

Harry Duncan Merrick, only son of Mr. and Mrs. Frank A. Merrick, of New Brighton, Pa., died June 5th, at 4 o'clock, at his home in Cleveland, O., of acute pneumonia, after but a few days' illness. The news of his death came as a great shock to his many friends in New Brighton and the Beaver Valley. Mr. Merrick had not been in good health for several years but had been able to attend to his business interests. He contracted pneumonia, but was not thought to be in a serious condition. His parents received a message that he was critically ill. They at once went to Cleveland and were with him when the end came.

Harry was born and raised in New Brighton and had many friends throughout the Beaver Valley who will mourn his death. He had been engaged in business in Cleveland for the past few years. He was 38 years of age and is survived by his wife, his parents, and one sister, Mrs. F. H. Darragh.



THE ORIENTAL MOTH (FERNALD).



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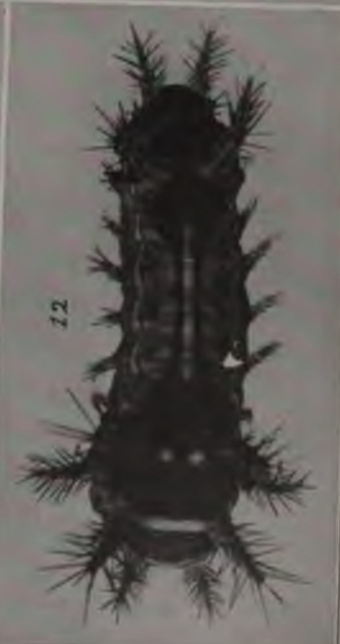

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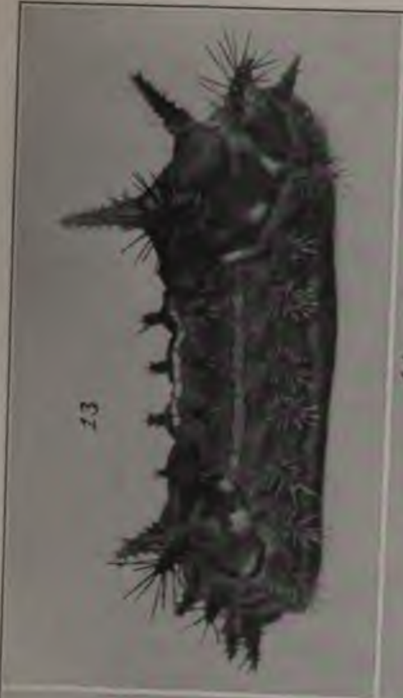

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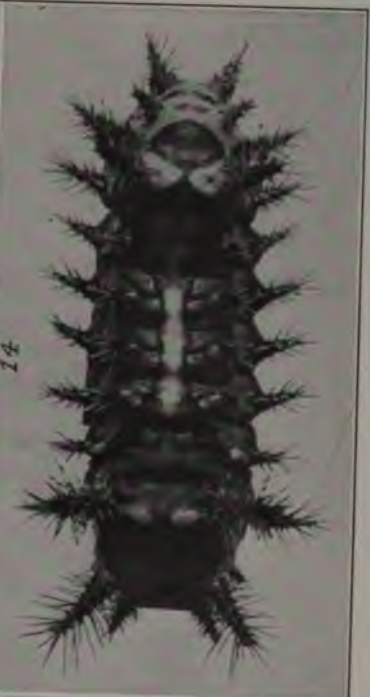

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THE ORIENTAL MOTH (FERNALD).

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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The Early Stages of the Oriental Moth.

BY H. T. FERNALD AND J. N. SUMMERS, Amherst, Mass.

(Plates X, XI.)

The early stages of the Oriental Moth, *Cnidocampa flavescens* (Walk.), have never been described and several attempts to obtain fertile eggs from the moths in captivity have failed. This has been supposed to be because the small space provided by a breeding cage either prevented mating, or because the confinement in some way affected the moths. To avoid such difficulties a large number of the cocoons of this insect obtained at Dorchester last spring were placed in a greenhouse in which several Norway Maples were growing, all openings having been screened with cheese cloth.

The moths began to emerge June 22nd probably rather earlier than would usually be the case in the field and certainly two weeks earlier than in Dorchester this year, the season being very late, and the first eggs were observed June 26th. The moths by this time had become very abundant in the house and eggs by the hundred were obtainable by the first of July.

During the day time the moths remain quiet, assuming a most grotesque position. Grasping some object, preferably the edge or petiole of a leaf, with their middle or hind feet they let themselves hang downward till the outer margins of the closed wings come against some object in which position they remain. At night they remain quiet till well after darkness before flying, not being crepuscular. Their flight is quite speedy and produced by very rapid movements of the wings and they are somewhat attracted by light. Their average life seems to be about a week or ten days.

The Egg.—The eggs are deposited on the underside of the leaf, mainly near the margin and preferably toward the apex. They are oval in outline, though sometimes a little irregular, lenticular, one of the surfaces being in contact with the leaf. They are about 1½ to 2 mm. in length by ¾ to 1 mm in width, transparent, though sometimes showing a faint milky white color. Examination under the microscope shows that the chorion is finely sculptured, irregular polygonal areas being present, the longest diameters of the polygons being more or less at right angles to the long axis of the egg. Scattered over the surface are tiny elevations or papillae averaging about four to each polygon, though many lie on the lines between the polygons. No micropyle was observed.

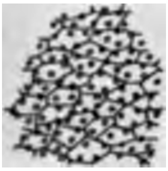

Fig. 1.—Portion of chorion—from camera drawing.

In the later stages the embryo becomes plainly evident and finally escapes through an opening in the side of the chorion after an embryonic life of six or seven days.

First Larval Instar.—The newly hatched larva measures about 1 mm. at rest and in motion elongates about 1.5 mm., the head being retracted into the second (prothoracic) segment when the larva is quiet. The head and second segment are much narrower than the rest of the body. The body increases in lateral diameter to the middle of the fifth segment, then tapers gradually to the end, which is rounded. Its vertical diameter is also greatest at the fifth segment. Annulations are very indistinct. The color is white and semi-transparent, except for a pale straw tinge which is seemingly internal in location. A row of sub-dorsal horns and a row of lateral horns is present on each side, the sub-dorsal horns being located one on each segment from the third to the [illegible] inclusive, while the lateral horns are on the third, fourth and [illegible] twelfth segments inclusive. The first three sub-dorsal [illegible] the diameter of the body, and the basal diameter about one-third their length. The fourth is rather smaller while the next four are still smaller and shorter. The last three, however, are much larger and increase in size, the last one being fully as large as the first one of the row. Each horn bears two or three black spines on its tip, the larger ones bearing three, and the smaller ones two, usually each spine being nearly as long as the horn on which it is borne. The horns are white with transparent areas. The first two lateral horns are about equal to the sub-dorsal horns of the same segments, in size and appearance, but the next six are rather smaller. The last lateral, however, is large and like the sub-dorsal of that segment. The larger of these horns bear three black terminal spines, while the smaller ones seem in some cases to bear but two, though the exact number could not always be determined. The color of the lateral horns is like that of the sub-dorsal ones. An evident depression along the mid-dorsal line is present. Color beneath like that above. Legs not distinguishable. Duration of instar, about three days.

Blackish streaks appear in the horns at the base of the spines toward the end of the instar—possibly the spines of the following instar.

Second Larval Instar.—Length 1 4/5 to 2 mm. at rest; about 2 2/5 mm. when in motion. Annulations of the body more pronounced. General color yellowish white, but there is a dark spot on each side of the head, the mouth parts are dark and the clypeal region is brownish.

Mandibles brown on edges, four-toothed. Maxillae showing two teeth or lobes. Viewed from beneath a cresentic lobe lies just above the mouth, bearing a number of hairs.

Antennae of three segments and a terminal bristle. The first three sub-dorsal horns are very large and stout, and bear many spines with black tips. The fourth is very small and bears two small spines. The fifth, sixth, seventh and eighth are larger, about equal in size, and each bears five or six spines. The ninth and tenth are much larger, equaling the second and third, and with many spines on the outer fourth. The eleventh is like the first, these two being the largest and having scattered spines to their bases. The first lateral horn is of medium size, rather blunt, but little longer than its basal diameter and bearing several terminal spines and a ring (?) of them a little lower. Second lateral very large—as large as the first sub-dorsal—about twice as long as its basal dimeter, and with numerous spines on its tip and sides. The third to eighth lateral horns, inclusive, are about the size of the first, short, stout, with a long spine or two at the tip and a few shorter ones on the sides near the tip. The ninth lateral is about like the eleventh sub-dorsal, but perhaps more slender. The lateral horns of the middle of the body are larger and stouter than the sub-dorsal horns of that region. Skin glistening, and with minute punctures. Heart beating plainly seen, and also dark-colored food in the alimentary canal. Legs very small, but actively used; of the usual structure.

Anal region noticeably punctured and with a few very small hairs between the anus and the lower margin of the eleventh sub-dorsal horns. A few scattered simple spines are present on the sides below the lateral horns. Duration of instar, four to five days.

Third Larval Instar.—Length, at rest, 3½ to 4 mm.; in motion, about ½ mm. greater. Head and body much as in the previous instar. Color deeper yellow. First sub-dorsal horn about 4/5 mm. long, nearly twice as long as the second and third. Fourth to eighth inclusive very short; ninth and tenth longer; eleventh nearly as long as the first. First lateral, short; second, about like the first sub-dorsal, third to seventh inclusive, very short; eighth longer; ninth nearly as long as the last sub-dorsal. The spines near the bases of the horns are shorter than those nearer the tips. Duration of instar 4½ to 5½ days.

Fourth Larval Instar.—Length at rest about 6 mm.; in motion, about 7¼ mm. Annulations of the body are now well pronounced. Sides of head darker than hitherto, with a median lighter area. General color greenish yellow. Along the mid-dorsal line is a white band extending from the sixth to tenth segments inclusive, external to which is a green stripe reaching from the fourth to the tenth segments. Between the bases of the sub-dorsal horns is an opaque yellow band, and between these and the lateral horns is a white longitudinal stripe.

The horns themselves appear to differ little from their condition in the preceding instar.

Duration of instar, 5 to 6 days.

Fifth Larval Instar. Length at rest, about 9 mm., in motion, about 10½ mm. As in all the preceding instars the color is at first nearly uniform, with only faint traces of the markings which later become [illegible] prominent, the spines becoming much darker. General color [illegible] larva when it has become pronounced, pale yellow. The stripes [illegible] like those of the last stage, except that the green band is hardly perceptible and the yellow between the sub-dorsal horns is darker. [illegible] this instar the fourth sub-dorsal horn is much reduced; the fifth [illegible] and seventh [illegible] the eighth [illegible] smaller [illegible] three-quarters [illegible] the first, the tenth [illegible], and the eleventh equal to the [illegible] first, second, third and ninth grow darker toward their tips. [illegible] length of [illegible] Spines somewhat darker [illegible] the [illegible] than in the previous instar [illegible] part and a slender [illegible] worse than [illegible] tips vary in length [illegible] days.

[illegible] Length at rest about 12 mm. [illegible] pale yellow, but with its colored areas [illegible] than heretofore. Head quite strongly [illegible] black, mottled with lighter. Antennae darker than before. Second segment with its surface granulated. Cervical shield dark brown, mottled with lighter. A large, dull red area covers the dorsal surface of the third segment behind its spines and the fourth and fifth segments, and extends backward as a wedge-shaped elongation on the mid-dorsal line on to the seventh segment. At the sides this area does not quite reach the lateral horns, and a band between and around the second sub-dorsal horns is yellow, as is also a pair of spots between the third sub-dorsal horns. At the side of the area a triangular blue spot is wedged into the area on a line between the second sub-dorsal and second lateral horns like a similar spot lateral to the third sub-dorsal horn, while a third blue spot, rather oval in outline, rests against the margin of the red area as it begins to narrow posteriorly, just lateral to and in front of the almost obsolete fourth sub-dorsal horn.

In the seventh segment the end of the red area encloses a blue stripe, lighter in the middle, extending into the tenth segment, where it is enclosed by one corner of a rather triangular dull red area which covers a part of the dorsum of that segment and all of the dorsum of the eleventh nearly as far back as the bases of the ninth sub-dorsal horns, and between which the area is slightly extended backward. Lateral to the tenth sub-dorsal horns which arise from yellow areas, the dull red extends backward somewhat, its outer margin in contact with three dull blue spots. From the hinder end of the lateral extensions a faint reddish band crosses the dorsum, completing the enclosure of the two yellow areas from which the ninth sub-dorsal horns arise. These two areas are separated from each other by a median blue spot on the anterior portion of the eleventh segment, from which a blue line passses backward crossed by the faint reddish band, and, in the area between the ninth and tenth sub-dorsals, forms a large spot tinged slightly with reddish. Extending from the blue spot in front of the fourth sub-dorsal horn to that on the tenth segment is a narrow, creamy white band margined on each side by an incomplete green line. A narrow yellowish band extends from the second lateral horn nearly to the posterior end of the body below the spiracles. Annulations of the body well marked. Duration of instar, 5 or 6 days.

Seventh Larval Instar.—Length at rest, about 20 mm.; in motion, about 22½ mm.; greatest diameter, about 11 mm. Head less bilobed than in the preceding instar. The red areas are darker and their outlines have changed somewhat, the anterior one beginning just behind the first sub-dorsal horns and covering the entire dorsum from one row of lateral horns to the other on the third, fourth and fifth segments, except as noted below; narrowing on the sixth to lie between the sub-dorsal horns of that segment, and narowing to a dorsal band on the seventh and eighth segments. On the hinder part of the ninth segment this band becomes somewhat broader, and on the tenth and eleventh segments it becomes quite broad, constricting, however, to a narrow band again, between the sub-dorsal horns of the eleventh segment, but then enlarging to form an oval spot. Just behind the sub-dorsal horns of the tenth segment a small lateral extension from this dorsal area connects it with an irregular patch of the same color which lies on the tenth, eleventh and twelfth segments between the sub-dorsal and lateral rows of horns. The median area and the lateral patches are so placed with reference to the sub-dorsal horns of the eleventh segment as to leave these arising from the centre of peninsulas of yellow, the isthmus being on the twelfth segment. The dorsal band is interrupted on the eighth and ninth segments by a blue spot on each segment, and there is a blue spot below the dorsal horn on the margin of the red area on segments four, five, six, ten and eleven, and a faint one on the twelfth segment. Anal shield greenish brown, crossed by two light bands. A similar patch occurs just below and lateral to it on each side, crossed by one band. The two fine green lines between the sub-dorsal and lateral rows of horns, described in the last instar, are present, but the creamy stripe they limit is absent.

There is a narrow yellow band between the two second sub-dorsal horns, which encloses their bases and extends a little lateral to them. At the base of each third sub-dorsal horn toward the mid-dorsal line is a yellow spot. In general the yellow color is deeper close to the margins of the red areas.

Fourth sub-dorsal horn very minute and bearing only one spine. The body, as a whole, is noticeably four sided.

Duration of instar, 5 or 6 days.

Pupation. The larva changes color somewhat as pupation approaches, the blue and red becoming duller, and the yellow assuming a reddish tinge. After finding a place on which to pupate the larva bites off any loose bark which may be present, smoothing the surface, then spins a loose network of threads around itself and attached to the bark, within which it forms the cocoon.

The threads of the cocoon are attached to the bark and are [illegible] back and forth, the larva moving its head along the lines of a figure 8 [illegible]. As the threads come closer, the larva [illegible] which causes the threads just being spun [illegible] in place and [illegible] of the [illegible]

During [illegible] the larva [illegible] as much as possible, drawing [illegible] segment and is able to move about [illegible]

[illegible] gradually darken [illegible] markings [illegible]. As far as outside appearances go, it is completed [illegible] hours, and at this time the outer network is often no ticeable over the cocoon, somewhat like the network of ropes outside of a balloon. This network soon disappears, however, probably weathering off.

EXPLANATION OF PLATES.

From Photographs by the Senior Author, all but the First Two Much Enlarged.

Fig. 1.—Oriental moth at rest on petiole of maple leaf.
Fig. 2.—Same at rest on tomato leaf.
Fig. 3.—First instar seen from above. Microphotograph. Spines retouched.
Fig. 4.—Second instar from above. Microphotograph.
Fig. 5.—Same in side view. Microphotograph.
Fig. 6.—Third instar from above. Microphotograph.
Fig. 7.—Same from side.
Fig. 8.—Fourth instar, side view.
Fig. 9.—Same, dorsal view.
Fig. 10.—Fifth instar, side view.
Fig. 11.—Sixth instar, side view.
Fig. 12.—Same, dorsal view.
Fig. 13.—Seventh instar, side view.
Fig. 14.—Same, dorsal view.

Thecla (Incisalia) polios.

By Henry Skinner.

This species was described by Cook and Watson in the *Canadian Entomologist*, Vol. XXXIX, Page 202, 1907. I have known the butterfly for about twelve years and I possess thirty-five specimens from various localities. I do not consider it specifically distinct from *Thecla mossi* Hy. Edws. I have examined the type of *mossi* and through the kindness of Mr. William Beutenmuller possess a fine colored figure of it. I also have homotypes. The species has a wide distribution and is quite variable. In *mossi* there is a white edge to the mesial band on the underside of secondaries, and in some specimens this becomes a hoary band or fascia about 2 mm. wide. The species extends across the continent from the Atlantic to the Pacific. I have specimens from New Jersey, New Hampshire, Nova Scotia, and Colorado. I have seen specimens in the collection of Mr. T. N. Willing, taken at Olds, Alberta, Canada, and the type (♂) come from Esquimalt, Vancouver Island. The species is figured on pl. 38, fig. 331, in Wright's Butterflies of the West Coast.

Preliminary Remarks on the Myrmecophily of the Caterpillars of the Family Lycaenidae.

By H. Viehmeyer, Dresden, Germany.

It is a more or less well-known fact that certain caterpillars of the Lycaenidae have a transverse slit, or aperture on the antepenultimate segment, through which they discharge a juice which is a much coveted and favorite food for ants. In consequence of this the caterpillars are much sought after by the ants on their food-plants and, like the plant-lice (Aphidae), are stroked with the antennae and so incited to discharge the juice. The ants, on their part, are said to afford the caterpillars a certain amount of shelter from many enemies, by giving the full grown caterpillars the opportunity of pupating (*i. e.* changing into a chrysalis) in their nests. Beyond this slit or aperture on the 11th, these caterpillars have further on the 12th segment two peculiar small tubes or tentacles, which can be stretched out and drawn in, and which bear at the tips fine spicules or a bristle-like crown. There is nothing known for certain about the use of these; they are supposed to be organs of defense, or means of attraction, perhaps means of defense against too importunate ants. Thomann considers both aperture and tentacles as adaptations to the ants' visits. For the slit or aperture no other evidence is necessary. Whether the extensile organs may be considered as adaptations depends upon whether they only occur in connection with the aperture. According to some literary assertions this does not appear to be the case. We cannot yet say with any certainty how far these assertions are important. The two organs in question are small enough to be partly or wholly overlooked by many observers. The caterpillars I have observed always show both or neither tokens, only with some caterpillars of the genus *Thecla* I was unable to come to a certain decision. The [illegible] caterpillars appeared to have an aperture but no tentacles. However, we must wait for the examination of living caterpillars or of those preserved in spirit. The views of [illegible] and others on the specification of individual caterpillar groups of this family by slit and tentacles are certainly erroneous

A survey of the literature shows that these marks occur in the most diverse groups of the Lycaenidae, most frequently in the Lycaena group, but it cannot be said generally that the caterpillars of the Lycaenidae or only the genus *Lycaena* are all myrmecophilous, for even in this genus we find, together with a great number of caterpillars undoubtedly equipped with myrmecophilous adaptation organs, others in which these tokens are wanting. In the literature many opinions are to be found on the matter; in how far they are trustworthy must be left undecided. Confining myself to my own observations, I can cite a caterpillar of the genus *Lycaena*, namely, *Lyc. optilete* Knoch. I made this discovery in the examination of the caterpillar collection of the late Dr. O. Staudinger.* In 13 species of caterpillars of the genus *Lycaena* I could infallibly identify the presence of aperture and tentacles. They can be comparatively easily and well recognized with a weak glass on mature and well blown-out specimens. The slit with its both edges is generally walled or blown up like a cone, and the tentacles are often stretched out, even the bristly crown sometimes is spread out. If the caterpillars are, indeed, not fully blown-out, one must observe them very closely. The tentacles, which are not stretched out, then generally appear like round light spots, appearing behind the last spiracles. The matter is, however, very questionable if the last abdominal segments, as can easily occur, are crushed or withered up. In specimens in alcohol both tokens can also be easily recognized.

Lycaena optilete was, as has been said, the only species in which these tokens failed. It was very difficult for me not to believe in some error or confusion; yet the type of caterpillar, the great number of specimens (15, and all especially well blown-out), the name of the collector, the conscientiousness of the former possessor of the collection, all must finally convince me of a fact which, when rightly considered is not to be wondered at. The plant-lice offer in this respect similar relations. From this—that aperture and tentacles never belong in general to one genus—then must follow, firstly, that all sorts of caterpillars of the Lycaenid family must be examined, and then that not only the positive condition—the verifying of such organs, but also the negative (non-existence) is very important. The great wealth of species of the family Lycaenidae and the very secluded habits of the caterpillars set very narrow limits to the first examination. In the collection of Dr. Staudinger I have been able to examine 45 Lycaenid caterpillars all belonging to the palaearctic fauna, and I must consider, according to present experience, that I have before me one of the greatest, if not the greatest, caterpillar collection. The much smaller one, which Mr. F. Griebel Speier,* was good enough to send for my inspection, contained also 6 further specimens of the tokenless species. Together, with all the species mentioned in the literature, we know about 85 specimens, a very small number compared with the great wealth of species in the family. We can gather from this how valuable every increase in knowledge is, even though of only one species. Especially with regard to the non-European species, we are entirely dependent on the literature for information; and just in this, it would be most important to receive material for comparison.

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*Chr. A. Bang-Haas, Blasewitz, Dresden, proprietor of the firm, Dr. O. Staudinger and A. Bang-Haas, was kind enough to allow me to examine this collection, and also to use the copious library, for which I here offer him my warmest thanks.

We can undoubtedly consider as myrmecophilous the following species :

Thecla tengstroemi *Ersch.*
Rapala schistacea *Moore.*
Lycaena admetus *Esp.*
  amanda *Schn.*
  arcas *Rott.*
  argyrognomon *Bergstr.*
    var. aegidion *Meissn.*
  argus *L.* aegon *Schiff.*
  arion *L.*
  astrarche *Bergstr.*
  caton *Bergstr.*
  bellargus *Rott.*

Lycaena corydon *Poda*
  cyllarus *Rott.*
  damon *Schiff.*
  escheri *HS.*
  eumedon *Esp.*
  hylas *Esp.*
  icarus *Rott.*
  iolas *O.*
  melanops *B.*
  melissa *Edw.*
  minimum *Fuessl.*
  orion *Pall.*

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* [illegible] partly [illegible] general [illegible] studies of the veins of the wings [illegible]

Lycaena scudderi *Edw.*
sebrus *B.* !
Zizera lysimon *Hübn.*
Cyaniris argiolus *L.* !
pseudargiolus *Bd.* & *Lec.*
Chilades lajus *Cram.*
arochilus *Fr.*
Lycaenesthes emolus *Godt.*
Catochrysops cnejus *Fabr.*
pandava *Horsfs.*
Polyommatus baeticus *L.* !
Azanus ubaldus *Cram.*
Tarucus theophrastus *F.*
Lampides aelianus *F.*
telicanus *Lang.*
Everes comyntas *Godt.*
Aphnaeus vulcanus *Fabr.*
Zalmenus evagoras *Don.*
ictinus *Hewits.*
Ogyris genoveva *Hewits.*
Gerydus symethus *Cram.*

Besides there still exists a small number of caterpillars where the question must remain for the present undecided, because either the possession of the organs in question has not been definitely verified, or opinions in the literature are contradictory. Of the greater part of the caterpillars mentioned here, nothing more, indeed, is known than that they live with the ants in Symbiosis. Which species of ant comes into question is, in the large majority of cases unknown. De Nicéville only can we thank for extensive information on the subject. Every butterfly collector who collects the Lycaenid caterpillars, should therefore not neglect to observe the ants that visit them, to observe the manner of their intercourse with the caterpillars, to preserve a number of ants in spirit, and to publish the well-determined names of both ants and caterpillars. It is by no means sufficient to say: "visited by a little yellow ant," or "in company with the common black ant." Generally it is not necessary to seek far for the ants, for the nest is often to be found under the feeding plant. Also the digging out of such nests often offers a proof of the living together of caterpillars and ants. In a whole series of Argus-caterpillars pupation seems to take place in the nest of their visitors. Perhaps also many species hibernate in the same place. Observations on this point have not yet been published. The question of in how far the shelter ascribed to the ants really exists would be greatly explained by such observations. An especial attention should be devoted to the behavior of the ants towards those butterflies which come out in their nests. No observations exist on the behavior of the species of ants to those caterpillars which they do not normally visit; thus the so-called "international relations" of the Lycaenid caterpillars should be studied in order to verify beyond doubt if the friendship between the ants and the caterpillars is limited to certain kinds only, or whether, as in the plant- and shield-lice it has a more international character. So far any hint or information is wanting on the phylogeny of the myrmecophilous adaptation organs as well as an anatomical examination of these, or a chemical examination of the juice which comes from them.

The commencement of a solution to many of these enigmas has been made; unfortunately most of these studies fail for want of the necessary materials. Therefore, I venture to ask the kind help of all those who are able to assist me in this matter. This could be given:

1. By sending me well-determined caterpillars of Lycaenidae (blown-out or in spirit, formol, etc.), particularly non-European specimens.*

2. By sending me ants that have been observed in company with caterpillars or nymphs (chrysalids), or by informing me of the well-determined names.

3. By informing me of other personal observations which have not as yet been published, and which bear upon observations and studies touching this subject.

Dresden A., 16, Reissigerstr. 21 (Germany).

* * *

Dr. James [illegible] Dr. Henry Skinner and Mr. [illegible] conducted a series of farmers' meetings in the Province of [illegible] [illegible] noxious weeds [illegible] and insects in relation to [illegible] Five hundred and fifty miles by rail and [illegible] were traversed [illegible] a most interesting [illegible] Dr. [illegible] and Skinner [illegible] a few days in the R[illegible] [illegible] of Canada.

[illegible] "A Report on a [illegible] [illegible] in the Spring [illegible] [illegible] pages [illegible] [illegible] Society of [illegible] [illegible] collected. One new [illegible] [illegible] This [illegible] [illegible] of the subject.

[illegible] Dr. K. [illegible] [illegible] the [illegible] [illegible] collections [illegible] [illegible] sent by their [illegible] return

Cook: In Defense of Incisalia henrici.

By HENRY SKINNER.

Mr. J. H. Cook, in the September, 1907, number of the journal of *The New York Entomological Journal*, p. 123, has published an article that is in part unnecessarily abusive, discourteous and untrue. I never take exception to just and proper difference of opinion or criticism, and it is very unpleasant for me to be compelled to answer some of his remarks. I do not intend to refer at this time to any differences of opinion we may have in regard to species of *Thecla*, but I do wish to reply to Mr. Cook's words on page 127 of his article. In ENTOMOLOGICAL NEWS* I said, "Having had occasion to study some Theclas . . . . I came to the conclusion that *Thecla henrici* Grote and Robinson is a pure synonym of *irus* Godart." The following letter from Mr. Cook, dated Albany, February 21, 1907, was received:

> "There seems, therefore, to be plenty of recent precedent to justify me in vilifying you to the extent of my vocabulary and in heaping great masses of obloquy upon your offending head for having had the temerity to express an opinion contrary to my own. If, then, you will kindly consider yourself smeared all over with vilification poultices and buried up to your eyes in obloquy I will take for granted the keen satire and uncomplimentary allusions, which should be the answer to such an attack. By so doing we can save valuable time and space and give the superheated atmosphere an opportunity to disappear. Thus we may get down to the facts sooner. And, now, that the preliminary controversy is over, you may be interested to inquire what it was all about. But seriously, Dr. Skinner, I think that you must have overlooked some recent literature on the subject, or you would not have permitted the expression of your very remarkable opinion on the specific validity of *Thecla henrici* to get into print. I enclose the literature†, to which I refer, and shall be very glad to explain any points which have not been made clear in the text."

I replied to this letter and refer to his article in one of my own in ENTOMOLOGICAL NEWS, Vol. XVIII, p. 129. Mr. Cook refers to the life history of *henrici*, as given by Mr. Edwards in the following words: "Edwards, who bred what he thought to be *henrici* (Papilio, I., 150-152), etc.," in the separate he sent me, and then in his recent article says: "Dr. Skinner can hardly plead that the facts were unknown to him without laying himself open to the charge of culpable ignorance of the literature of his subject." . . . . This reference is in none of the catalogs, including my own. I later received another letter from Mr. Cook (March 3, 1907), to which I also replied, and my letter had a return address on it, too. I will not quote this in full, as I wish to save space. He practically repeats his argument given in Can. Ent., Vol. XXXVII, p. [illegible] and in addition says: "The larvæ and eggs are sufficiently unlike to enable the veriest tyro to distinguish between them at a glance." Mr. Cook had not published anything on the larva of *henrici*, and he scores me for suppressing facts communicated in a letter. He knows perfectly well that I replied to his letter, and I also told him I did not consider it proper to take cognizance of anything not in the literature of the subject. I had the temerity and audacity to have an opinion of my own in regard to the matter and have thereby been charged with culpable ignorance, suppression of evidence and discourtesy. Mr. Cook knew perfectly well that I received his letter, and the inference he wishes drawn shows almost malicious deception. His feeling is shown in [illegible] first letter, where I permitted the expression of a very remarkable opinion to get into print. Even though I may have been wrong I do not think I owe Mr. Cook any apology for my opinion. If those interested in natural history are compelled to accept the ipse dixit of everyone [illegible] it is high time different methods are adopted. I can [illegible] nothing in his letter that should have prevented the [illegible] attack. After considering myself [illegible] with vilification and bared to the eyes in [illegible] I did not expect to see it in print also.

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* Vol. XVIII, p. 45.

† Can. Ent., Vol. XXXVII, p. 216.

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P[illegible] Mr. J. H. [illegible] have been spending [illegible]

Messrs. [illegible] and J. A. G. Rehn were collecting in the Southwest [illegible] were the most [illegible]. We will hear later the results of the journey.

An Insect Ventriloquist.

By A. N. CAUDELL, Washington, D. C.

That man is not the only creature possessing ventriloquous ability is a fact admitted by all students of nature. Many birds are known to be excellent ventriloquists, and any person who has collected insects through the notes of their song knows that many of our species are adepts in the art. Belonging to the order Orthoptera are a number of species that, at times at least, are not readily located by means of their stridulation. Usually, however, a circular walk of fifty feet or so in diameter will encompass the songster and quite accurately locate its position. Rarely is a specimen found over a hundred feet or so from its apparent position.

The most extreme case of deceptive location of a singing insect that ever came under my observation, and I have located many a noisy orthopteron by its song, occurred on the evening of August 2d, of last year. Dr. Dyar and I were stopping at Longmire's Springs, at the base of Mt. Rainier, in Washington. About dark, as we were strolling up the road through the forest, we heard an insect stridulating by the roadside. I at once recognized it as an orthopteron, but one whose note was unfamiliar to me. Both Dr. Dyar and I readily located its apparent position in a small bunch of twigs not over eight feet from us. Being very desirous of capturing the insect I cautiously approached, but when I reached the spot where I supposed the creature to be secreted the sound no longer seemed to proceed from that point, but from an old stump a dozen feet further on. This new position was carefully approached, only to find the delusive sound moved to a point a few yards still further on. I now proceeded to persistently follow that spooky note from point to point, sometimes straight ahead and sometimes to one side or the other, till a distance of over two hundred yards was traversed. Dr. Dyar, lacking the enthusiasm of an Orthopterist in a quest of this nature, strolled on, leaving me to pursue my *ignis fatuus alone.* My chase led me over great stones, under fallen logs, across a ravine and up a steep hill. Darkness approached rapidly, the little light remaining of the fast dying day was lost amid the great evergreen trees about me. The fantom note, ever sounding beyond me, together with my somber surroundings, brought over me a feeling of exaggerated loneliness that made light and human companionship very desirable. I therefore gave over my fruitless chase and hastened back to the road and was soon pouring my tale of woe into the unsympathetic ears of Dr. Dyar.

Other specimens of the insect were heard singing as we returned, and the next evening, armed with a very dirty lantern kindly loaned us by an accommodating host, we sallied forth to capture one of the songsters. This we succeeded in doing, capturing two males after much climbing over and under fallen timber. The species proved to be, as I had surmised it would, *Cyphoderris piperi*, a species described by me some time before from the same locality. The very large and inflated elytra of this insect seem especially adapted to the production of ventriloquous notes. The effect was probably intensified in the case cited above by local conditions. The difference between the apparent and actual location varies, as that of the two specimens captured was not so much as that observed the preceding evening, being probably something over one hundred yards.

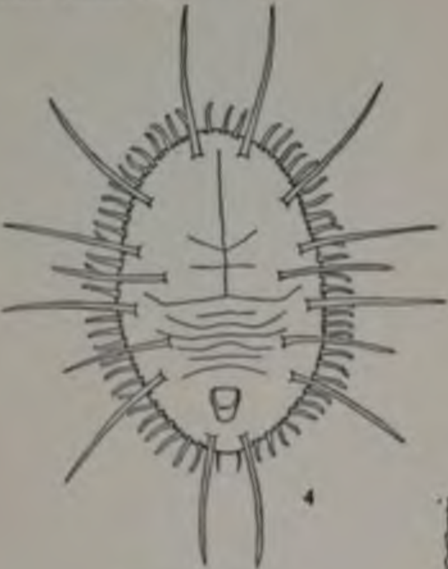
Cyphoderris piperi was described as a variety of [illegible] *strosa*, but it is very surely a distinct species and should be so listed. Like *monstrosa*, which has been reported as [illegible] by Lutley, *piperi* is slow of motion, and when disturbed shows little inclination to leap. The specimens taken by Dr. Dyar and myself crawled slowly along the twigs [illegible] which they were resting, keeping on the side opposite the [illegible] observer. They sometimes stridulate quite persistently [illegible] their song when closely approached.

* * *

[illegible]

[illegible] Arizona [illegible]

BRITTON ON ALEYRODIDÆ.



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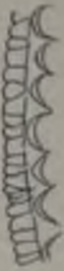

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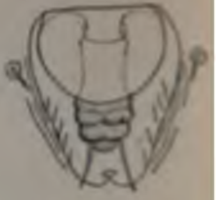

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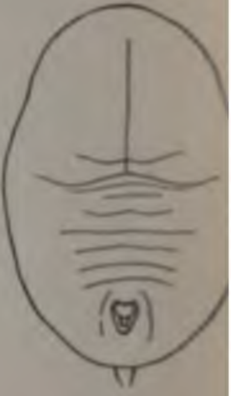

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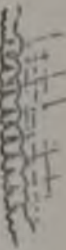

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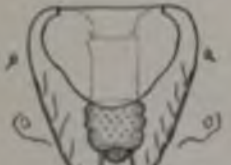

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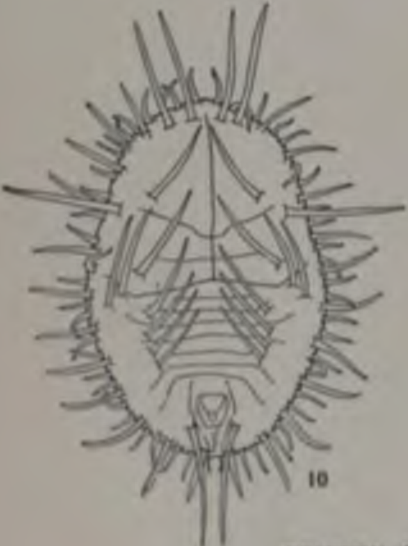

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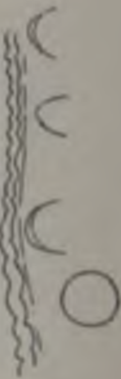

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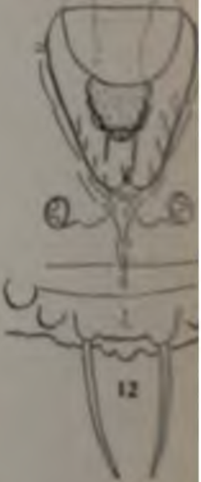

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BRITTON ON ALEYRODIDÆ.

Some New or Little Known Aleyrodidae from Connecticut.—III.*

By W. E. Britton.

(Plates XII, XIII.)

I wish to call attention to an error that has appeared in a previous paper of mine. In writing of *Aleyrodes mori* Quaintance (see Entomological News, Vol. XVII, p. 129), I made the statement that "Morrill described a subspecies *maculata* (Psyche, Vol. X, p. 81, 1903), which differed from *mori* in the adult stage by having a bright yellow body." As a matter of fact *mori* has the bright yellow body, and the body of the subspecies *maculata* is white with black markings.

In corresponding with Dr. Morrill, I am now convinced that the specimens taken in Connecticut represent his subspecies *maculata* instead of the type, which, according to his observations, is much more limited in range than *maculata*.

Aleyrodes coryli sp. nov.

Egg.—Unknown.

Larva.—Oval in shape, rather more than two-thirds as broad as long, and of light yellowish color. Margin and vasiform orifice darker yellow than other portion. Margin bears short, slightly curved glassy wax rods, and a pair of short incurved hairs at caudal extremity. The dorsum bears no wax rods or secretions of any kind.

Pupa Case.—Length from .65 to .74 mm.; greatest breadth .38 to .47 mm. Shape broadly oval, slightly constricted cephalad of the middle, with the posterior slightly more pointed than the anterior extremity. Color of pupa light greenish yellow, empty pupa skins white. Raised from surface of leaf by a vertically striated wall of wax about 134 μ high. Dorsum slightly convex, furrowed transversely according to adult segmentation. Marginal area radially and deeply corrugated or wrinkled. Margin finely crenulate. Six pairs of straight or slightly curved upright wax rods from 200 μ to 230 μ long are borne upon the dorsum a short distance from the margin; one pair each is borne at the cephalic and caudal extremities, the latter pair being closer together than the former; the other four pairs are nearly equidistant from each other, but are slightly nearer the cephalic pair than the caudal pair. The other pairs of slightly shorter rods are situated as follows: One pair on last thoracic segment, just in

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* For the preceding papers on this subject, see Ent. News, Vol. XVI, p. 65, March, 1905, and Vol. XVII, p. 127, April, 1906.

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BRITTON ON ALEYRODIDÆ.

lobe spiny and projecting between two much longer spines about 10 μ in length. Papillose for almost its entire length.

Adult.—Eyes reddish, apparently, but not nearly divided. Wings white, immaculate, semitransparent. Granular wax secretion very scanty, almost wanting, and this insect does not have the meally or floury appearance common to many species of *Aleyrodes*. Body yellow, legs and antennæ white.

Female.—Length of body about .86 mm.; length of forewing about 1 mm.; breadth of forewing about .45 mm.; hind tibia about .38 mm

Male.—Length of body about .73 mm.; length of forewing about .93 mm.; breadth of forewing about .40 mm.; length of hind tibia about .34 mm.; length of antenna about .38 mm.

Types.—U. S. National Museum.

Cotypes.—Collection of Connecticut Agricultural Experiment Station, New Haven, Conn.

Described from 4 ♀ s, 17 ♂ s, and many pupa cases.

Habitat.—This species occurs on *Juglans*, being found on the under surface of the leaves. It was collected on black walnut, *J. nigra* at the Station July 22d, 1904, by B. H. Walden; the writer collected it at Mt. Carmel, Conn., September 24th, 1904, and at New Canaan, Conn., September 15th, 1905, on butternut, *J. cinerea*, a few specimens only occurring on a leaf A similar species probably identical was observed by the writer at Surry, N. H., September 6th, 1902, on butternut leaves

Named after my assistant, Mr. B. H. Walden.

Aleyrodes merrilli sp nov

Egg Unknown

Larva Yellowish or greenish white, vasiform orifice yellow and darker Oval, dorsum flat without spines, rods or other wax secretions

Pupa Length about .70 mm., breadth about .48 mm., color light greenish yellow empty pupa cases white, translucent, vasiform orifice darker Broadly oval in shape, with a slight constriction or narrowing about one third the body length from the cephalic extremity Dorsum flat or very slightly convex, with a coriaceous, granular or more or less wrinkled appearance, marked transversely corresponding to adult segmentation, and without spines, rods, or a secretion of wax in any form Raised from the leaf by a wall of wax about 115 μ high Margin very finely crenulate almost entire with no wax fringe [illegible] extremity [illegible] a pair of curved setæ about 22 μ in length and about 22 μ distant from each other

Vasiform orifice subtriangular with angles rounded, about four fifths as broad as long. Operculum semicircular, slightly broader than long, and reaching nearly half the length of the orfiice.

Lingula spatulate, irregularly seven-lobed, rather coarsely papillose for nearly its entire length. Pair of spines about 16 μ long at extremity, one each side of terminal lobe.

Adult.—Eyes strongly constricted, but not divided. Wings white, immaculate; body, head, legs and antennæ pale yellow. Entire surface of body and wings covered with a mealy secretion of wax.

Female.—Length of body about .86 mm.; length of forewing about 1.34 mm.; breadth of forewing about .54 mm.; length of hind tibia about .38 mm.

Male.—Length of body about .76 mm.; length of forewing about 1.05 mm.; breadth of forewing about .44 mm.; length of hind tibia about .33 mm.

Types.—U. S. National Museum.

Cotypes.—Collection of Connecticut Agricultural Experiment Station, New Haven, Conn.

Described from 20 ♀ s, 9 ♂ s, and hundreds of pupa cases.

Habitat.—This species was very abundant on jewelweed, *Impatiens fulva*, in West River meadows, New Haven, Conn., in the seasons of 1904 and 1905, and a supply of material was collected by the writer on September 17th, 1905. The writer has also collected it on the same species of plant at Sunnyside, Tarrytown, N. Y., August 15th, 1904; Poquonock, Windsor, Conn., September 12th, 1904; New Canaan, Conn., October 5th, 1904; and Woodbridge, Conn., July 28th, 1905. Many leaves contained only one or two specimens, but in other cases there were between forty and fifty individuals on a single leaf. A single hymenopterous parasite was found in one of the slide preparations, but the species has not been identified.

A. morrilli is allied to *A. fernaldi* Morrill, but differs from that species in not having the dorsum of the pupa covered by an amorphous waxy secretion characteristic of *A. fernaldi.*

Named after Dr. A. W. Morrill, who has studied several species of *Aleyrodes.*

The writer here desires to acknowledge his indebtedness and to express his thanks to Professor A. L. Quaintance, who has kindly examined the specimens and the manuscript.

The accompanying plates illustrate the more important features of these three species. Plate XII is from photographs of the dried leaves, but it shows fairly well the appearance of the insects upon them. Plate XIII is from line drawings.

DESCRIPTION OF PLATES.

PLATE XII.

1. *Aleyrodes coryli* on hazelnut leaves, natural size.
2. *Aleyrodes waldeni* on butternut leaf (lower side) natural size
3. *Aleyrodes morilli* on leaves of *Impatiens fulva*, natural size

PLATE XIII.

4. *Aleyrodes coryli*, pupa case X 60.
5. Margin of pupa case. X 400
6. Vasiform orifice. X 400.
7. *Aleyrodes morilli*, pupa case. X 60.
8. Margin of pupa case. X 400.
9. Vasiform orifice X 400
10. *Aleyrodes waldeni*, pupa case. X 60
11. Margin of pupa case. X 400.
12. Vasiform orifice and posterior extremity of pupa case X 400

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Notes on Eupithecia, with descriptions of new species.

By John A. Grossbeck.

The hitherto much neglected genus, *Eupithecia*,* has suddenly been the subject of considerable study by lepidopterists working more particularly in the Geometridæ. My own studies were directed to it because of my inability to identify specimens for correspondents, so after consultation with Mr. R. F. Pearsall, of Brooklyn, we agreed to jointly work over the group paying special attention to the eastern species. Mr. Pearsall's collection contained quite large series of a number of species taken for the most part in the Catskill Mountains, and we were fortunate in securing for study the material in the collections of the American Museum of Nat. Hist., New York, through the courtesy of Mr. Wm. Beutenmuller, that in the Academy of Natural Sciences, Philadelphia, through Dr. Henry Skinner as well as the private collections of Messrs. L. W. Swett, of Bedford, Mass., and Wm. H. Broadwell, of Newark, N. J. We are also indebted to Mr. Wm. T. Davis, of Staten Island, for the loan of a specimen identified by Mr. Grote as his *miserulata.*

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* [illegible]

My first step was to straighten out the species in the Hulst collection at New Brunswick, the result of which forms the bulk of the present paper; then Mr. Pearsall and myself worked over the material in the Brooklyn Institute Museum, following which Mr. Pearsall came to New Brunswick and corroborated most of my conclusions. At Prof. Smith's suggestion I went to Cambridge to study the Packard types, and Mr. Pearsall spent a few days at Washington in looking over the collection there, so that nearly all the types of our eastern species have been seen.

At the commencement of our work we were not aware that Mr. Geo. W. Taylor, of Wellington, was working over the species of the same general territory, believing that he was confining himself to the northwestern fauna, as far as this genus was concerned. The appearance of his paper* has therefore anticipated some of our work, and as a result Mr. Pearsall has left me to publish such of my notes as might contribute toward a better understanding of the group.

Eupithecia nebulosa Hulst (Trans. Am. Ent. Soc. xxiii, 266, 1896).

This species was described from specimens taken in New York, New Jersey and Texas. Considering the wide range given it would appear as though two species were confounded, but from a study of all the types, except the New Jersey specimen, no characters can be found that are not common to all specimens. The Texan types are rather abraded and it is obvious that the description was not drawn from them; therefore should it eventually turn out that two species are confused, the name should be held on the eastern one. All the types examined, save one from Texas, are in the Hulst collection at New Brunswick; the odd specimen is in the Brooklyn Institute Museum.

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* Can. Ent., xxxix, 164.

Eupithecia palpata Pack. (Fifth Rep. Peab. Acad. Sci., 58, 1873).

This specimen was made a synonym of *E. lucata* Pack., by Packard himself in his Monograph of the Geometrid Moths. In the paper by Mr. Taylor, above referred to, it is listed as a species*, a conclusion that I myself had arrived at after a study of the types. Besides the difference in size and color, as stated by Packard, when he made the two species one, the extradiscal line in *luteata* is angulated on vein R_3, while the corresponding line in *palpata* is evenly rounded, and the palpi in the former are only half as long as in the latter. *E. columbiata* Dyar, described from British Columbia, is a close ally of *luteata*.

Eupithecia subcolorata Hulst (Can. Ent. xxx, 114, 1898)

Dr. Hulst described this species from at least three specimens representing two species. One type, a male, without locality and labelled as having been taken in August, is in the Brooklyn Institute Museum, and is the same as a male type at New Brunswick, from the San Francisco Mts., Ariz. 8-10,000 feet, July 20, 1907. To this insect Mr. Pearsall and myself agree to hold the specific name, since the underside, the maculation of which is characteristic, was obviously described from it. The third type, a female, from Arizona August, is a smaller moth, as yet undescribed; but its condition does not warrant making it the type of a new species. In describing the upper surface of *subcolorata* Hulst drew his diagnosis largely from this species, so the description is a bad misfit to the insect, to which we have limited the name. To render the species recognizable I append herewith a redescription of *subcolorata*.

Expanse, 21 mm. Palpi and front blackish with scattered white scales, vertex almost entirely covered with whitish scales, collar white. Thorax clothed with about equal numbers of black and whitish scales, the anterior part and base of patagia wholly black. Abdomen [illegible] segment darker than the rest. Ground color of all wings whitish, [illegible] lightly [illegible] with blackish scales which [illegible] strong and contrasting black lines that form cross lines [illegible] these white lines, the basal, [illegible] separated by a fine black line and evenly rounded throughout its course. The second or intradiscal line is also geminate, broadly outcurved from costa to R_1, then curved inwardly and gently waved to inner margin forming a sharp internal angle between Cu and anal veins. The median line is represented by a narrow blackish shade line that runs directly through the discal spot; it is most prominent on the costa and bent in on vein Cu. The extradiscal line is composed of three parallel whitish lines that extend in a straight line from costa to vein R, then describe a bold outward semicircle, slightly drawn in on each vein to Cu_2, and thence proceed doubly angled to inner margin. Subterminal line dentate, not very strongly indicated. Terminal line black, broken at the veins. Fringe checkered blackish and dirty white. In the central portion of the wing in the median area the veins are strongly marked with black just inward of the extradiscal line, as in almost the whole of the Cu. Discal spot jet black, somewhat transversely elongated and pointed at the ends. Near the anal angle is a geminate white spot. Secondaries with two blackish lines crossing wing on outer half, the inner with an internal angle on anal vein. Two or three other lines on inner margin extend but a short distance into the wing. Terminal line black, contrasting. Discal spot large, black. Beneath, all wings are clear white, all the black markings of the upper surface reproduced, sharply in contrast to the white ground color.

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* [illegible] maintained in a continuation of his paper (Can. Ent. [illegible]

Described from a beautiful specimen from Yavapai Co., Ariz., that agrees with the type.

Eupithecia miserulata Grt. (Proc. Ent. Soc. Phil., ii, 32, 1863).

This species has caused more trouble than any other *Eupithecia*, chiefly on account of the fact that Grote determined and distributed other better known species by that name, and it was supposed, therefore, that *miserulata* was a common form. Not until it was realized that many species of *Eupithecia* occurred in the eastern states, several of which passed as *miserulata*, was an effort made to identify Grote's species. Mr. Taylor and Mr. Swett, independently of each other, arrived at the conclusion that a certain insect was *miserulata;* while Mr. Pearsall and myself, also independently of each other, reached the conclusion that a different insect was *miserulata*, and our opinion was strengthened when we found that a specimen in the collection of Mr. Davis, determined by Grote as his species, was identical with ours. In the collection of the

Acad. Nat. Sci., at Philadelphia, where the type was said to be deposited, I failed to find a specimen labelled so; in fact, there was nothing in the collection as *miserulata*, so I believed it to be lost. Later, however, when Dr. Skinner sent me his *Eupithecia* material, I found among them a specimen entirely without label, which exactly agreed with Grote's description, except that it measured a trifle less than ¾ inches whereas Grote gives ¾-⅞ inches. It is very likely, however, that Grote measured without the aid of a rule, otherwise he would have given exact measurements when speaking of a single example.

Now, that the type is found, it proves to be a rare insect; at least I can identify no available specimen with it, though I have one from New Brunswick, which is much the same but lacks the black terminal line and the checkered fringes.

Mr. Swett has furnished me with several specimens, which, he says, are conspecific with Mr. Taylor's determination of *miserulata*. This is a different insect and is described herewith as *swetti*, in honor of Mr. Swett.

Eupithecia swettii n. sp.

Expanse, 21-24 mm. Length of fore wing of largest specimen [illegible] 11.5 mm; breadth from middle of costa to anal angle 5.5 mm. Outer margin almost straight, apex rather pointed. Palpi of moderate length [illegible] deep brown, narrowly margined with white scales [illegible] front and vertex gray, the former [illegible] [illegible] ringed gray and [illegible] second segment of the [illegible] brown. Ground color of wings a [illegible] wings [illegible] midway [illegible] toward costa [illegible] from the [illegible] marked on the [illegible] center of costa [illegible] [illegible] the best defined [illegible]

This begins on the costa in a triangular patch a little outward of discal spot and extends to vein R, then curves outward in a bold semicircle and runs inwardly obliquely to inner margin being drawn in on all the veins, the sharp angles sometimes forming dark brown dashes on the veins. Following the extradiscal line is a broad band of ground color succeeded by a dark shade which extends to the terminal line and is traversed through its center by an ill-defined zig-zag white line. Terminal line deep brown, interrupted at the veins. Fringe concolorous with ground color checkered with darker blocks. Discal spot moderate in size, dark brown, linear. Secondaries with four broad and somewhat diffuse transverse brown lines besides the deep brown, interrupted terminal line. The first two of these are within the small discal spot and extend from the inner margin well into the wing becoming then obsolete; the other two are outward of the discal spot and cross the wing completely being somewhat outwardly scalloped in their course. Fringe as in the fore wings. Beneath, the ground color is as on the upper surface and the more pronounced markings of that side are clearly reproduced beneath. Discal spots present on both wings and very distinct.

Habitat.—Sharon, Mass., April 30 to May 3; Framingham, Mass., May 7.

Types.—Five specimens, ♂ type and co-types in Mr. Swett's collection, ♀ type in the collection of the author.

Eupithecia latipennis Hulst (Can. Ent., xxx, 114, 1898).

Dr. Hulst described this from specimens received from Mr. Hanham, who collected them at Quebec, Can. I have seen three types, which are probably all there are. One of these in the Brooklyn Institute Museum, and one of the two at New Brunswick is the same as Packard's *albicopitata;* the remaining type, a male, is quite different from anything else and is left to represent Hulst's species. His description applies very well to the species as here limited.

Eupithecia absinthiata Clerk.

Mr. Taylor is entirely correct in striking this European insect from our list. He is also right in his use of the name *coagulata* Gn., for the small species, which now stands as the male type of *geminata* Pack. I have seen specimens like the one in the collection at Cambridge, which bore the reddish tinge referred to by Guenée. *Geminata* is a large *Eupithecia,* dull clay yellow in color and entirely distinct from *coagulata.*

Eupithecia fumosa Hulst (Tr. Am. Ent. Soc., xxiii, 269, 1896).

Hulst named this species from at least two specimens, citing South Abington, Mass., and Brockport, N. Y., as the localities whence the types came. There are two specimens labelled "type" at New Brunswick, one from the first mentioned locality; the second, bearing an Amherst, Mass., label, cannot be a type. Where the Brockport, N. Y. example is and whether it is like the South Abington specimen I am unable to say. It may be in the National Museum. At all events, *fumosa* is a good species, belonging to the *absinthiata* group.

Eupithecia tenebrescens Hulst (Can. Ent., xxxii, 103, 1900).

In the Monograph of Geometrid Moths, page 51, Packard described a species of *Eupithecia* as *zygadeniata*, his specimens coming from Bosque Co., Texas, March 23-24, from Belfrage, who bred them from larvæ. It appears that a specimen from Belfrage's lot found its way into Dr. Hulst's collection at a date after he (Hulst) believed he had *zygadeniata* in his possession. His determination, however, was erroneous, so he redescribed it as *tenebrescens*, new species. The type is a beautiful female specimen, evidently bred and mounted while fresh, and bears a date 20/3, in Belfrage's characteristic manner of labelling. It was not directly compared with Packard's type, but it is a striking species, and there is no room for doubt that the two names apply to one species.

Eupithecia strattonata Pack. (Fifth Report Peab. Acad. Sci., 60, [illegible]).

This species listed in our catalogues as a synonym of *Eucymatoge anticaria* Walk., is rightly given specific rank by Mr. Taylor. I have two specimens precisely like the type and both have but a single accessory cell, whereas all the specimens of *anticaria* I have seen have two. Badly rubbed examples of *strattonata* look something like *anticaria*, but in good specimens of both species there is hardly a point of resemblance between them.

Eupithecia gelidata Moesch. (Wien. Ent. Monats., iv, 47, [illegible]).

There is a Labrador specimen of this species in the Hulst collection, and I have had for comparison examples of [illegible] of Europe, of which Staudinger and Rebel say it is a variety. Mr. Taylor is apparently willing to accept their decision, but after careful study I would separate *gelidata* as a species principally on the course of the extradiscal line, which in *gelidata* is broadly and evenly rounded to the center of the wing, whereas in *nanata* it is angular on vein M. The lines of the hind wing, as is clearly seen from beneath, also show similar differences—sharply angled in *nanata*, almost straight in *gelidata*.

Eupithecia carolinensis n. sp.

Expanse, 18.5 mm. Palpi dark brown, short, rough scaled beneath, projecting only slightly in front of head. Entire head dark brown. Thorax grayish with some dark ochreous scales anteriorly. The abdomen is greased but is apparently dark brown with dark ochreous scales on the apex of the segments. Primaries crossed by five pairs of grayish-white lines. The basal line is evenly outcurved from costa to inner margin. The intradiscal line curves slightly outward from costa to cell, then extends inwardly obliquely to inner margin being a little waved in its course. The median pair extend sharply outward from costa, the inner line bordering the discal spot externally, then inward to Cu from where it runs inwardly obliquely to inner margin forming angles on Cu and anal veins. Extradiscal line much more evenly rounded outwardly with faint inward angles on R_5 and Cu_2. Subterminal line vaguely marked taking a dentate course through the terminal space. Terminal line very fine, scarcely darker than outer area. Fringe whitish bordering terminal line, gray on exterior portion. There are two quadrate, dark brown blotches on the costa, one internally of the median line, the other internally of the extradiscal line. The area between the inner of the double extradiscal line and the subterminal line is overlaid with a band of bright ochreous scales which on the inner margin extends across the extradiscal line to the median line. Discal spot oval, moderate in size and not very prominent. Secondaries grayish overlaid with a scattering of fuscous scales. Two wavy lines cross the wing, one through the center and one between this and the outer margin. Others are faintly indicated on inner margin of basal area. Discal spot small, round and not very distinct. Beneath, light gray, on the primaries irregularly suffused with fuscous from base to extradiscal line and again on the submarginal space, the intervening area, corresponding to the ochreous band of upper side, being pale gray. Secondaries very pale gray, almost white, the median line broad and well marked, the terminal area overlaid with fuscous. Discal spot on fore wing prominent, on hind wing almost absent.

Habitat.—Valley of Black Mts., N. C., taken by Mr. Wm. Beutenmüller on Aug. 23.

Type.—One male in excellent condition in Am. Mus. Nat Hist., N. Y.

Differing from all known eastern species of the genus by the deep ochreous band crossing the fore wings on outer two-thirds.

Three new species of Acrididae (Orthoptera) from California.

By JAMES A. G. REHN.

The following new forms were contained in a series of Californian Orthoptera submitted to me by Prof. C. F. Baker.

Hippiscus sierra n. sp.

Type: — ♀; Mt. Tyndall, elevation 12,000 feet, Tulare Co., California. (C. F. Baker.) [Acad. Nat. Sci., Phila.]

Closely allied to *Hippiscus calthulus* Saussure from Nevada and *croceus* Scudder from Idaho. The relationship to the former is not as close as to the latter, from which *sierra* differs in the intercalary vein being placed nearer the median than the ulnar vein, in the fusion of the axillary with the anal vein, in the much narrower, shorter and weaker fuscous band of the wing, and in the reddish instead of citron disk of the latter. The structure of the pronotum as described in *croceus* agrees very closely with the new form, which may be separated from *calthulus* by the much smaller size, the broader band of the wing, the color of the internal face of the caudal femora and that of the caudal tibiae.

Size small for the genus, form robust. Head with the occiput [illegible] elevated; fastigium moderately declivent, about as wide as long, the cephalic width about half the median, due to the distinct [illegible] lateral foveolae; caudal boundary of the fastigium marked by an [illegible] transverse carina; median carina distinct, but not high on the [illegible] fastigium; interspace between the eyes about twice the width [illegible] portion of the frontal costa; a pair of depressions are placed [illegible] tween the fastigium and frontal costa, which latter is narrow dorsal[illegible] [illegible] ventrad except for a slight constriction ventrad of [illegible] [illegible] slightly depressed area present around the ocellus but otherwise [illegible] punctate; eyes hardly prominent, subovoid in out[illegible] about equal to the infra-ocular sulcus in length; antennae slightly longer than the head and pronotum together, slightly depressed, the distal section not curled. Pronotum with the disk considerably flattened, the surface of the disk with irregular, usually linear rugosities; cephalic margin very broadly obtuse-angulate, caudal margin slightly acute-angulate, lateral margins of the metazona angulate but not carinate, slightly expanding caudad, metazona almost twice as long as the prozona; lateral lobes of the pronotum distinctly deeper than long, ventro-cephalic angle disdistinct, ventro-caudal angle broadly rounded, sulci deeply impressed. Tegmina reaching caudad of the apex of the abdomen by nearly the length of the pronotum; costal margin arcuate distad, apex rounded; mediastine vein strong, little curved; intercalary vein as a whole nearer the median than the anterior ulnar vein. Wings with the greatest width contained about one and two-thirds times in the length, costal margin slightly sigmoid, apex rounded, the axillary field arcuate in the margin; discoidal vein with three rami. Interspace between the mesosternal lobes nearly twice as broad as deep; interspace betwaen the metasternal lobes slightly narrower than the interspace between the mesosternal lobes, but somewhat shallower and as distinctly transverse. Cephalic and median limbs slender. Caudal femora moderately expanded and with carinae well developed as usual in *Hippiscus*, the ventral carina moderately but not greatly expanded mesad, the pattern of the pagina deeply impressed; caudal tibiae armed with eight to ten spines on the lateral and internal margins.

General colors mottled bistre and burnt umber. Head variegated with fine lines and threads of buffy dorsad and with a scrumbling of ecru drab ventrad; eyes tawny-olive; antennae of the general colors, darker distad. Pronotum with a considerable amount of buffy mottling on the prozona, on the lateral lobes the same portion has a median subquadrate dark patch, relieved ventrad by a pale line, metazona washed with dull maroon purple. Tegmina with a great number of small subquadrate blotches, which are congregated proximad and about mesad to form two very poorly defined bands. Wings with the disk pale geranium red, the proximal two thirds of the anterior field bistre, the transverse band rather weak and narrow, continued around to the caudal margin but not reaching the proximal one, greatest width of the band less than a sixth the length of the wing; apical third hyaline except for a slight clouding in the extreme apex. Caudal femora wood brown, with three transverse and oblique bands of bistre, the bands being distinct dorsad, but weak laterad and ventrad, the proximal one only present on the dorsal and part of the ventral face, genicular region suffused; caudal tibiae greenish yellow, the tips of the spines black.

MEASUREMENTS.

Length of body	29	mm.
Length of pronotum	6.5	"
Greatest caudal width of disk of pronotum	5.	"

Length of tegmen	27.5 mm
Greatest width of tegmen	6. "
Greatest width of wing	14. "
Length of caudal femur	14.2 "

The type is the only specimen of the species seen by the author.

Bradynotes excelsa n. sp.

Types:—♂ and ♀; Mt. Tyndall, Tulare Co., California. elevation 12,000 feet. (C. F. Baker.) [A. N. S., Phila.]

Allied to *B. referta* Scudder from Logan Co., Idaho, and mountains near Lake Tahoe, California, but differing in the narrower interspace between the eyes, in the frontal costa being hardly wider dorsad than the basal antennal joint; in the metazona being twice as long as the prozona, in the length of the pronotum being contained three times in the length of the caudal femora and in the absence of an abdominal carina.

Size small; surface sub glabrous. Head with the occiput rounded. interspace between the eyes no wider than the inter-antennal width of the frontal costa (♂) or about half again the width of the same (♀). fastigium very strongly declivent, very broadly and shallowly sulcate in both sexes, the sulcation extending caudad between the eyes; frontal costa subequal, no wider (♂) or slightly wider (♀) than the proximal antennal joint, undefined ventrad of the ocellus, biseriate-punctate dorsad, not sulcate; eyes moderately prominent in the male, less so in the female, short ovate in outline in both sexes, cephalic margin more flattened in the female than in the male, in length equal to (♀) or slightly longer than (♂) the infra-ocular sulcus, antennae about equal to the length of the head and pronotum in the male. Pronotum rounded, cephalic margin truncate with a very slight median emargination, caudal margin very broadly and shallowly emarginate, lateral angles rounded and no carina present, median carina indicated by the faintest possible trace on the cephalic section of the prozona and on the metazona, transverse sulci impressed, particularly the principal caudal sulcus, prozona in both sexes over twice the length of the metazona, lateral lobes slightly longer than deep, ventral margin rounded with a very slight cephalic sinuation. Mesonotum with the caudal margin slightly arcuate in the male, very slightly emarginate mesad in the female; metanotum truncate in the male, distinctly emarginate mesad in the female. Prosternal spine very short, thick and blunt, interspace between the mesosternal lobes over half again as broad as long (♀) or twice as broad as long (♂). Tegmina and wings absent in both sexes. Abdomen somewhat compressed, not carinate, apex moderately elevated and slightly recurved in the male, furcula of the male extremely small, divergent, supra anal plate of the male, with the margins regularly but not greatly converging in the proximal two-thirds, distad of which they approach one another much more decidedly, apex rounded, median paired carinae regularly converging from the base; cerci simple, tapering in the proximal three-fourths, subequal in the distal fourth and slightly curved ventrad in that section, apex blunt; subgenital plate very broad, the margin not passing through the apex which is produced, trigonal, blunt and somewhat flattened dorsad, when viewed laterad slightly curved dorsad. Cephalic and median femora much more robust in the male than in the female; caudal femora moderately slender; caudal tibae with eight spines on lateral margin.

General color vandyke brown dorsad, cinnamon (♂) or wood brown (♀) ventrad, the male being wholly suffused with a rufescent coloring. Head with distinct blackish post-ocular bars as well as a pair of blackish occipital maculations; eyes burnt umber (♂) or drab (♀); antennae burnt sienna (♂) or wood brown (♀). Pronotum with the post-ocular bars continued across its whole length and reaching to the caudo-lateral angle of the pleura, in the female two spots of ecru drab on each side being enclosed in the blackish bar; disk of the metazona lighter in color than the prozona in both sexes. Mesonotum and metanotum dark mesad, pale laterad; pleura almost uniform, very dark brown, this being a continuation of the pronotal bars. Caudal femora with two rather broad dark brown transverse bars which follow the lines of the paginae in crossing the lateral face, being thus < shaped, genicular region very dark, internal face and ventral sulcus scarlet vermilion except for a narrow pale pregenicular annulus; caudal tibiae ochraceous, infuscate proximad, spines and spurs tipped with black.

MEASUREMENTS.

	♂	♀
Length of body	16.5 mm.	18.8 mm.
Length of pronotum	2.8 "	3. "
Greatest width of disk of pronotum	2.8 "	3.6 "
Length of caudal femur	9.2 "	10.5 "

A paratypic male has been examined in addition to the types.

Oëdaleonotus truncatus n. sp.

Types:—♂ and ♀; Mountains near Claremont, Los Angeles Co., California. (C. F. Baker.) [A. N. S., Phila.]

A member of this genus but not at all closely related to *Oe. enigma*, the only previously known species of the genus. The character which immediately strikes one in both sexes of the species is the truncate caudal margin of the pronotum and the greater longitudinal arching of the same. In the male the more rounded eye, the narrower interocular space and frontal costa, more prominent lateral angles of the pronotum and the longer, more attenuate cerci will separate the new form. In the female the caudal expansion of the pronotum the more prominent lateral angles of the pronotum and the longer lateral lobes, as well as the longer and somewhat slenderer caudal femora, will distinguish *truncatus* from *enigma*.

Size rather small; form moderately compressed and slender for the genus. Head with the occiput arched and slightly, but distinctly, elevated above the general level of the disk of the pronotum; interspace between the eyes not (♂) or very slightly (♀) wider than the inter-antennal portion of the frontal costa; fastigium moderately declivent, distinctly sulcate in both sexes, though more deeply and with sharper lateral margins in the male; when viewed laterad the fastigium rounds into the line of the face, which is slightly produced between the antennae; frontal costa at the junction with the fastigium hardly wider than the proximal joint of the antennae, regularly expanding ventrad to the ocellus, not marked ventrad of this, slightly depressed around the ocellus, not sulcate but biseriate-punctate; eyes ovate, more flattened cephalad in the female than in the male, in both sexes very distinctly longer than the infra-ocular sulcus, when viewed from the dorsum the eyes are moderately prominent in the male; antennae almost equalling the head and pronotum in length in the female. Pronotum subdeplanate dorsad in the male, slightly tectate in the female; cephalic margin of the disk subtruncate, caudal margin subtruncate with a very slight median emargination, lateral margins [illegible] late but not carinate, the angle somewhat rounded on the meta[illegible] female; median carina distinct in both sexes, evanescent between [illegible] sulci, weaker in the female than in the male, prozona half again as [illegible] as the metazona in the male, slightly less than half again as [illegible] female; transverse sulci more marked in the male than in the [illegible] disk of the pronotum of a greater width caudad in the female [illegible] portionately in the male; when viewed laterad the dorsal [illegible] prozona [illegible] slightly but distinctly arcuate; lateral lobes distinctly [illegible] than deep, the cephalic margin gently arcuate, the caudal [illegible] both convex, the ventral margin very broadly and bluntly angulate [illegible] azona [illegible] lateral lobes closely and sharply punctate [illegible] [illegible] not attingent dorsad, nearly twice as [illegible] [illegible] again as long as broad in the female [illegible] Abdomen tectate in both sexes [illegible] apex recurved in the male [illegible] account of the strongly recurved apex [illegible] in the proximal third, tapering regularly [illegible] apex, which also has a slight curve toward [illegible] median line; supra-anal plate trigonal, slightly longer than wide, apex rather blunt; subgenital plate broad, the apical margin U-shaped, a slightly elevated rugose area is situated cephalad of the margin proper. Prosternal spine conical, slightly depressed. Interspace between the mesosternal lobes slightly longer than broad in the male, subquadrate in the female; interspace between the metasternal lobes small in the female, the lobes subcontiguous in the male. Cephalic and median femora considerably inflated and bowed in the male. Caudal femora reaching beyond the apex of the abdomen in both sexes, moderately inflated, the greatest width contained more than three times in length; caudal tibiae with nine spines on the lateral margins.

General color of the male clay color marked with clove brown. Eyes prout's brown; postocular bars continued across the dorsal section of the lateral lobes of the pronotum, deep and irregularly delimited ventrad on the prozona, very narrow and sharply defined on the metazona, the disk of the pronotum also slightly infuscate mesad. Pleura clove brown; the mesosternum and a line on the carina of the metapleura of the general color. Tegmina isabella color margined ventro-proximad with clove brown. Abdomen in the proximal half strongly washed laterad with clove brown. Caudal femora with the lateral and internal faces with three blotches of clove brown, the genicular arches weakly washed with the same color, ventral sulcus scarlet vermilion; caudal tibiae verditer blue, spines cream-buff tipped with black; tarsi soiled buff.

Female with the general color bistre, isabella color on the face and venter, postocular bar narrow and not sharply defined; caudal femora with no markings, but the ventral sulcus similar to that of the male only somewhat duller; caudal tibiae dull glaucous-blue, irregularly and rather minutely mottled with brown.

MEASUREMENTS.	♂	♀
Length of body	17.2 mm.	21.5 mm.
Length of pronotum	4.5 "	5.5 "
Greatest caudal width of disk of pronotum	3. "	4.3 "
Length of tegmen	3.4 "	3.1 "
Greatest width of tegmen	1.8 "	2 6 "
Length of caudal femur	11.5 "	13.2 "

In addition to the types a single paratypic female has been examined. This specimen is slightly larger than the female type, of a lighter general color, the yellow tint being more apparent, and with the blue of the caudal tibiae much deeper. The tegmina are also slightly shorter, but the differences are of interest only to show that the species varies in size, somewhat in minor structural characters like the proportion of the tegmina and also in color.

Contributions to the knowledge of Rhynchophora.*

By W. Dwight Pierce, U. S. Bureau of Entomology.

(Paper No. 1, Part I.)

Considerable work has been done during the past year by the members of the Cotton Boll Weevil Investigation commission upon the biology of weevils and their parasites. The purpose in view has been to throw side lights upon the biology of *Anthonomus grandis*, and also to obtain parasites which might be propagated upon the weevil. The result has been very favorable, as is shown in a bulletin of the Bureau of Entomology just prepared for publication by the writer. The miscellaneous notes obtained, which are foreign to the subject matter of that bulletin are embodied in the present paper.

It may be asserted with propriety that considerable light will be thrown upon the systematic relationships of insects by breeding work. In a group of weevils such as the Barini, where the species are very close, a study of the breeding habits and of the characters displayed by the immature stages is necessary in order to obtain the correct definition of closely related species.

CLEONINI.

LIXUS Fabr.

1 **Lixus musculus** Say.

A few notes were obtained on this species in addition to those published in Bull. 63 of the Bureau of Entomology

A few galls of this weevil were found October 2 and [illegible] 1906, at Dallas, Texas. Four galls were found, all parasitized

PARASITES.

Glyptomorpha rugator Say (det. by Dr. W. H. Ashmead This Braconid evidently is in the habit of hibernating in its cocoon as a pupa. From cocoons isolated in cell, September 28, 1905, parasites were bred as follows. April 21st, two males; April 25th, one female; April 30th, one female; May 3rd two females; May 8th, one female; May 24th, one female; June 12th, one female The material was collected at Clarendon, Texas.

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* [illegible] the [illegible] work of the Bureau of Entomology, [illegible]

Cerambycobius cyaniceps Ashm. (det. by Dr. W. H. Ashmead. One female of this Eupelmine was bred from a weevil larva from which six other parasites of another species were also bred. This is the first time the writer has bred more than one species of parasite from a single weevil individual. The gall was collected at Dallas, October 2nd, the pupa of the parasite being observed first October 12th, and becoming adult October 26th.

The other parasites formerly bred were *Neocatolaccus tyloderma* Ashm. and *Eurytoma tylodermatis* Ashm., both primarily parasitic on stem weevils.

2. **Lixus scrobicollis** Boh.

This weevil is found to breed in the stems of *Ambrosia psilostachya* and *trifida* throughout Texas. The eggs are laid close together in a slit in the stalk, and the larvæ burrow throughout the stem making their cells sometimes very close together. Oviposition occurs in the spring, but the pupæ have not been found before October 11th. They probably hibernate as pupæ or adults in the stem.

PARASITES.

Glyptomorpha rugator Say was bred by Mr. W. W. Yothers from Victoria material, April 17, 1905.

ERIRHININI.

DESMORIS Lec.

Desmoris scapalis Lec. is a species closely resembling the boll weevil, *Anthonomus grandis* Boh., and is frequently mistaken for that species by the people at large. It breeds in the seed heads of *Sideranthus rubiginosus*, the egg being inserted through the involucre among the seed. The presence of the developing larva is indicated frequently by the darkening of the bracts through which the ovipositor passed. The larva feeds entirely upon the ripening seeds making a spherical cell of exuvial material which becomes very hard, due to the hardening of the natural gum of the flower. When the seed are ripe they are ejected and with them falls the larva in its cell. It immediately enters the ground, making a small earthen cell in which it hibernates and in the following spring pupates. Parasitism occurs only upon the larvæ in the flower head, as far as is known. The adults have been taken in copula June 6th at Corsicana, Texas. During June and the early part of July the adults are mainly engaged in feeding upon the tender, succulent terminal buds. The *Sideranthus* does not flower much before the first of August, at which time oviposition commences. The larvæ enter the ground in August, September and October. In the spring of 1906, from material collected September 19, 1905, at Mexia, Texas, the following data were obtained. Larvæ were found as late as July 2nd, while the first pupa was obtained May 29th, and the first adult June 28th. On July 2nd there were found three larvæ, one adult, four teneral adults and three mature adults in cells.

PARASITES.

Bracon mellitor Say, *Bracon mellitor dorsator* Say (det. by J. C. Crawford). From the Mexia material, F. C. Pratt bred one female of the typical red form, also one male, and one female of the smaller dark form, September 20, 1905; one typical female and one dark male, September 29, 1905. One female was bred from Calvert material, September 23, by Mr Pratt.

ASSOCIATED SPECIES.

Lygranthoecia mortua Grote (det. by Dr. H. G. Dyar). A large Noctuid occurs in large numbers in the heads of the *Sideranthus*. The caterpillars generally clean out several heads during their period of development, and in so doing kill a large number of the *Desmoris* larvæ. If any of these caterpillars are allowed to remain in the breeding cage they destroy every weevil larva present. They enter the ground when full grown and spin a very loose silken cocoon within their elongate cell of earth and then pupate. Hibernation takes place in this stage. The first moths were bred September 6, [illegible] from material collected September 19, 1905, at Mexia.

Smicronyx tychoides Lec. was bred from stem galls on dodder by A. C. Morgan and C. R. Jones at Victoria, Texas. The galls were first collected August 1, 1906. The larvæ when fully developed leave the gall and enter the ground for pupation. They are in the ground approximately sixteen days before maturity.

ANTHONOMINI.

ANTHONOMUS Germ.

Anthonomus fulvus Lec. In addition to notes published in Bulletin 63 of the Bureau of Entomology the following may be given: the breeding period commences early in May and extends a short time beyond July 12th.

PARASITES.

Bracon mellitor Say was previously recorded as a primary parasite.

Catolaccus incertus Ashm. was also bred from this weevil June 14, 1905, at Dallas, Texas, by W. W. Yothers.

Anthonomus æneolus Dietz. The typical material in this species was bred by Mr. E. A. Schwarz at Columbus, Texas, from leaf galls on a *Solanum*, probably *S. elæagnifolium*. At Dallas, Texas, the writer has bred a species which is apparently the same from the buds of *Solanum torreyi*. The eggs are laid in the buds, and the larvæ develop entirely in the interior of a single anther, or of two anthers cemented together. The flower generally opens normally, and it is probably that fertilization frequently takes place. Pupation takes place in the anther, generally after the bud or corolla has dropped. The pupal period is not over six days. This *Solanum* commences to bud early in May, and by June 15th is about entirely out of bloom. In the latter part of June *Solanum elæagnifolium* commences to bloom and the weevils then attack it, after the same manner as the preceding plant. By July 1st *Solanum rostratum* is in bloom, continuing in season until fall. In it the larvæ seems generally to be confined to the large double anther. They are not as abundant as in the spring upon *Solanum torreyi*.

PARASITES.

Catolaccus incertus Ashm. (det. by J. C. Crawford) was bred as the predominant primary parasite.

Anthonomus nigrinus Boh. Buds of *Solanum carolinense* containing immature stages of this species were collected by F. C. Chittenden at Washington, D. C., for the purpose of breeding parasites. The larvæ work differently from those of the preceding species in that they make their cell in the centre of the narrow bud, through the pistil and anthers, thus preventing the opening of the flower, and causing an early dropping of the infested buds. An examination of material collected about July 3rd yielded one hundred and eleven weevil stages, of which 18 or 16.2% were parasitized.

PARASITES.

Catolaccus incertus Ashm. Quite a number of specimens of this species were bred.

Anthonomus squamosus Lec. This weevil was found by the writer breeding in the flower heads of *Grindelia inuloides* at Dallas, Texas, August 4, 1906, and was identified from its pupa. A larva presumably of this species was found in a flower head of *Grindelia grandiflora* Hook. (det. by C. F. Wheeler), collected at Paris, Texas, September 2, 1905, by F. C. Bishopp.

ASSOCIATES.

Rhagoletis grindeliae Coq. Two specimens of this new fly were bred June 2, 1906, from cells in the heads of *Grindelia squarrosa nuda* collected at Clarendon, Texas, September 1[illegible], 1905. The external indication of the presence of this insect is identical to that of *Anthonomus squamosus*. The larva makes a little cell among the seed. It is white, with both apices flat and black.

Agromyza jucunda Walk. (det. by Mr. Coquillett). One specimen of this fly was bred from the flower heads.

Urellia mevarna Walk. (det. by Mr. Coquillett). Several specimens of this beautiful fly were bred. The robust white larvæ, with head and apex of abdomen flattened and black appear like little barrels. They occupy cells very similar to those made by *Anthonomus squamosus*, and their presence is indicated in the same manner. The pupæ are brown. These flies were bred during September, 1905. The biology is short

Eupelmus dynii French (det. by Dr. W. H. Ashmead). One specimen of this parasite was bred. Its host is not known.

Polynema œcanthi Ashm. was found to be an abundant parasite of *Œcanthus* eggs in the stems of the *Grindelia*.

Lygranthœcia mortua Grote (det. by Dr. H. G. Dyar). One specimen of this moth was bred September 2, 1906, from a pupa which was formed in September, 1905. This moth pupates in the ground in a little silken cocoon. This individual is smaller and lighter in color than those bred from *Sideranthus rubiginosus*.

Cydia grindeliana Busck. The type material of this species was found breeding in large numbers in the flower heads of the *Grindelia*. The entire metamorphosis is passed in one flower, where it feeds in the larval stage upon the seed. When young of *Anthonomus* occur in the same flower head they are very likely to be devoured by larvæ of this Tortricid.

Anthonomus albopilosus Dietz.—This species was found to breed in the seed of *Croton capitatus* and *Croton engelmanni*, and probably of *Croton texense*. It was found breeding at Johnson's Bayou, Louisiana, August 26, 1906; Olivia (Calhoun Co.), Texas, September 2; Victoria, Texas, September 6; Texarkana, Arkansas, September 10, by J. D. Mitchell; and at Leesville, Louisana, September 29, by F. C. Bishopp. The larvæ generally clean out the interior of one seed and then pass to a second, and sometimes the third, in which they pupate. The developmental period is probably not longer than one month.

PARASITES.

Catolaccus incertus Ashm. is the principal parasite. It was bred from the Johnson's Bayou and Leesville material.

Cerambycobius cyaniceps Ashm.—Two females were bred from the Johnson's Bayou material.

Bracon mellitor Say.—One specimen was bred by Mr. Mitchell at Victoria.

MACRORHOPTUS Lec.

Macrorhoptus estriatus Lec.—This species was found to breed in the seed capsules of *Callirrhoë involucrata*. It occurs from Dallas to Sinton (San Patricio Co.), Texas. The adults are frequently found in the flowers. The egg puncture resembles that of *Anthonomus grandis* in its wart-like appearance. Larvæ were first found June 10th at Dallas, and adults were bred between June 20th and July 15th. At Sinton, Texas, Mr. Mitchell took adults in copula March 29th.

TYCHIINI.

TYCHIUS Sch.

Tychius sordidus Lec.—This species was found breeding in the seed pods of *Baptisia leucantha* at Logansport, Louisiana, June 7, 1906, by the writer. The larvæ were found in the pods feeding externally upon the seeds, and were decidedly yellowish in color. As many as three were found in one pod. The larvæ left the pods and entered the ground on and after June 15th. Pupæ and adults were found in the cells July 6th. The pupæ are at first yellow, becoming tinged with red on the thorax and head, toward maturity.

CRYPTORHYNCHINI.

CONOTRACHELUS Sch.

Conotrachelus affinis Boh. and *C. posticatus* Boh. were bred from prematurely fallen hickory nuts collected June 8, 1906 at Logansport, Louisiana, by the writer. The larvæ clean out practically the entire nut and then enter the ground for pupation. Adults were bred July 5th.

PARASITES.

Myiophasia aenea Wied. (det. by W. D. Hunter and D. W. Coquillett). One specimen of this Tachinid was bred July 6th as a primary parasite.

ASSOCIATES.

Siphonella inquilina Coq.—Quite a number of this little fly were bred from the nuts. The eggs are laid in the imperfectly closed egg puncture of the weevil. The larvæ follow in the burrow of the weevil, sometimes overtaking it and probably killing it.

CEUTORHYNCHINI.

AULEUTES Dietz.

Auleutes tenuipes Lec.—This species was found by the writer to breed in the buds of *Galpinsia hartwegi* at Dallas, Texas. The eggs are placed in the very small buds without an external trace of the puncture. The buds neither wilt, nor fall, nor discolor, for the larvæ dwell exclusively in the interior of the long anthers which in the bud lie longitudinally. They start at the lower end and eat upwards and are frequently still in the anther when the flower opens, yet they are seldom killed by exposure to the sun. The larvæ are white when very small and yellow when older. At all stages they are possessed of a remarkable ambulatory power, emitting a liquid through which they can glide. They probably can go from flower to bud, because some seen in open flowers were very minute, and small holes were frequently found in buds which contained larvæ. The flower falls the day after blooming, but the larvæ probably leave before then. When full grown they enter the ground and form a very small earthen cell in which they pupate. The longest period from collection of buds to maturity of adult was 17 days, the pupal period being about 7 days. The first larvæ were found May 11, 1906, the first pupæ May 18th, the first adults May 28th, being bred from then on until June 29th.

PARASITES.

Catolaccus incertus Ashm. (det. by J. C. Crawford) was bred frequently as a primary parasite. The larvæ of this species pupate in the bud or flower.

MR. E. T. CRESSON, JR., Librarian of the American Entomological Society, will visit the western part of the United States this fall. He is making a study of the Diptera and is specially interested in Muscidae.

A VERY important paper has been published by Mr. F. D. Godman in the Annals and Magazine of Natural History, Ser. 7, Vol. xx, 1907, on the American Species of Hesperidæ, described by Plötz. This work makes it possible to know what the many species described by Plötz really are.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., OCTOBER, 1907.

The Seventh International Zoological Congress held in Boston, Massachusetts, from the 19th to the 24th of August is now a matter of history. We were gratified to see the number of papers presented on the various branches of entomology, about twenty-five. This is a very creditable showing for this branch of Zoology. The abundance of insects, both as to species and individuals, and their vast economic importance is going to create an immense interest and rapid growth of the study. Many entomologists were in Boston during the Congress and they comprised about one-fifth the entire attendance. The meeting of The Entomological Society of America was a factor in this, but nevertheless it shows the present interest and we predict that the time is rapidly coming when entomology will leave far behind some of the studies in Zoology that at present have comparatively many devotees. In the future an entomologist will be looked upon with more respect and only the illiterate will speak of bugs and bugging.

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It is with interest that I note Mr. Brehme's remarks on *Thecla damon* and his proposed name for the black variety *patersonia*. Some less local name might have been chosen. I have taken this dark form here in Montgomery County, Virginia, in late July, and I have taken it in early April, on the sea coast islands at Charleston, South Carolina. I have, at present, two specimens in my collection, a South Carolina ♂ and a Virginia ♀; both are evenly dark colored above, a dead wood black, below, the green is less vivid than in the typical form, being more bronzy in tone. The Virginia specimen is very large.—ELLISON A. SMYTH, JR., *Blacksburg, Va.*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Dr. J. F. McClendon has been employed as Resident Naturalist to the Marine Biological Association of San Diego, California, this past summer.

Prof. E. D. Sanderson, Professor of Zoology and Entomology, has been made director of the Experiment Station at New Hampshire College and C. S. Spooner, Assistant Entomologist.

Who Lives in Cecropia Cocoons?—In looking over a mass of *cecropia* cocoons, I was surprised by finding scores of the tiny, pearl-gray, globular cocoons of *Chrysopa* attached to all parts of the outside of the looser cocoons of *cecropia*. The flies emerged, most of them, within two days of my bringing the cocoons to a warm room. A fine *Ichthyura apicalis* emerged from one of the medium-sized cocoons, and a little dead beetle tumbled out of another which I was cutting open. Two or three small egg-masses of spiders were just inside the loose mouths of small cocoons. It would be interesting to know what creatures winter in cecropias door-ways.—Caroline Gray Soule.

Corrections and Additions to Andrenae of the Canadian, Alleghanian and Carolinian Plant Zones occurring or likely to occur in Connecticut (see July number Ent. News, 1907).

Page 280, between lines 6 and 7 from bottom, insert Facial fovea more than one-half as wide as the distance between the lateral ocellus and nearest eye margin . . . . 6.

" 281, to line 6 from top, between "line" and "15" add: or line drawn from lowermost margin of antennal fovea to lowermost margin of its fellow.

" 281, line 4 from bottom, change "golden or brown" to brown, abdomen appearing bare.

" 281, at bottom of page, add as alternative to two preceding alternatives:

Like *nivalis* in most points, but abdomen sericeous.
Anal fimbria brown . . . . **perplexa viburnella.**
Anal fimbria golden . . . . **pruni.**

" 283, change **mandibularis** to **thaspii.**

" 285, line 17 from bottom, change "or" to plus (+).

" 286, lines 5 and 6 from bottom, strike out = *viburnella* = *pruni* = *dunningi*; at bottom of same page add *Andrena pruni* Rob. (= *dunningi*) and *Andrena perplexa viburnella* Graen.

" 287, transpose *vestita* so line will read *Andrena nasoni* (= *vestita* = *hartfordensis*) and change *mandibularis* (= *thaspi* to *thaspii.*

Note on the Name of the Pepper-Weevil of Mexico and Texas.—Dr. Alfred Duges, of Guanajuato, in a letter of June 3, 1907, informs me that the "Pepper-Weevil" (*Anthonomus aeneotinctus* Champ.), should be known by the name of *Anthonomus eugenii* Cano, and in this I have no doubt he is correct. Donaciano Cano's figures and description of *A. eugenii* [La Naturaleza, Series 2, ii, pp. 377-379, t. 17 (1894)] have never been noticed in the "Zoological Record," and of course had not been seen by me. His figure of the insect would apply equally well to various allied Mexican forms, but as some of our specimens of *A. aeneotinctus* (described in the Biologia in 1903) were received from the same locality—Guanajuato—from M. Sallé, they are almost certain to belong to the same species. According to Cano, *A. eugenii* attacks various "chiles" (*Capsicum*). The larva (fig. 1), pupa (fig. 2), insect (fig. 3), anterior leg (fig. 4) and apex of rostrum (fig 5) are figured by him in the Naturaleza. The insect is known as the "barrenillo" in Mexico.—G. C. Champion, Horsell, Woking, England.

At an informal entomological dinner held at the residence of Mr. Victor L. Clemence, Pasadena, Cal., on Thursday evening, July 11, 1907, the following were present: Mr. William S. Wright, of San Diego; Mr. E. K. Harvey, Mr. O. W. Howard and Mr. V. W. Owen, of Los Angeles; Mr. Don. White, Mr. Don. Ross, Prof. H. C. Fall, Mr. V. L. Clemence and Mr Fordyce Grinnell, Jr., of Pasadena. A sumptuous and elegantly served dinner occupied the time from 6.30 to 8 P. M. Neat souvenir cards, representing different butterflies, with the names of the guests, were arranged at the respective places at the table. Other entomological diversions added to the interest, combined with more technical entomological discussion. From 8 to 11.30, when the meeting adjourned, enthusiastic and informal discussion on entomological subjects was indulged in by the persons present. Mr. Owen, who has just returned from Arizona, and Mr. Wright, of San Diego, had much of interest to say. Mr. Harvey exhibited a box of tropical Mexican insects illustrative of mimicry and protective resemblance, and Mr. Clemence's well-arranged and suggestive collection was shown. Those present went away with renewed entomological enthusiasm, and it was voted to hold more of these gatherings in the future.—Fordyce Grinnell, Jr.

Oviposition of *Languria mozardi* Latreille—A female of this species was observed on June 23d, 1903, at Blacksburg, Virginia, ovipositing into the stem of a species of *Leucanthemum*. It was first found busily engaged in excavating a hole or improving an already excavated one, about 2 millimeters in diameter. Upon approach of the observer it became frightened, but after his remaining perfectly quiet for a short time the beetle renewed its activity. The method followed was very simple, and on that account of interest.

After preparing the nidus, the female leisurely walks up the stem the length of her body, and after feeling a little, fits the tip of the abdomen into the excavation and places an egg. After deposition she wheels in her tracks with almost military precision, simply reversing her position and commences to prepare another place for an egg in the same excavation. The female works with economy, wheeling about each time, so that the tip of the abdomen approached the excavation at each deposition, and then again to the rear, so that the jaws would strike the excavation when about to prepare a place for the next egg. Thus, in preparing the cavity, the beetle was facing up, with her body below it; when about to deposit the first egg she simply moved forward the length of her body, and afterwards simply wheeled in her tracks, when about to prepare a place for the second egg. The succeeding depositions were executed by wheeling about each time. Therefore, each completed movement, consisting of two wheels to the rear, accomplished the deposition of two eggs, occupying about 4½ minutes.

During the observation the female deposited at least 15 eggs, using the same nidus, and being engaged on the eighth completed movement. The specimen was determined through the kindness of Dr. L. O. Howard.—A. A. GIRAULT.

AN EVIL-SMELLING BEETLE.—For a number of years past the writer has been receiving accounts from his friends, who make their summer homes on the shores of Muskoka Lake, of a certain insect, which is said at times to occur quite numerously and to emit a fearfully repellant odor. Several attempts to identify the insect have been made at my request, and specimens of various lepidoptera, diptera, hymenoptera, and hemiptera have been submitted to the writer, all of which were unmistakably incapable of producing the nauseous exhalations which were complained of. Recently, however, the true offender has come to hand, and it turns out to be the small carabid beetle known to science as *Nomius pygmaeus* Dejean, and it should be called the polecat of the coleoptera. There is only one species of the genus known. It occurs in southern Europe and in many places in our own country from Georgia to California and as far north as Lake Superior. According to Dr. LeConte the beetle "exhales a strong, fetid odor." The specimens received in the mail, which are before me as I write, do indeed exhale an exceedingly strong odor, comparable to that of a mouse well advanced in the process of decomposition. I can well understand that the tenants of the beautiful cottages about Beaumaris, if these insects are numerous, must be at times greatly annoyed by them.— W. J. HOLLAND.

THE HEADQUARTERS of the Newark Entomological Society, on the fourth floor of the Newark Turn Hall, was completely destroyed by fire in the early morning of June 3d, 1907. The conflagration demolished not only the entire building, but also resulted in the loss of three lives.

The property of the Society consisted of a forty drawer cabinet containing one thousand specimens of Lepidoptera and two thousand five hundred specimens of Coleoptera, mostly representing local forms besides a small collection in other orders; also a book case with one hundred and ten bound volumes and three hundred and sixty two unbound volumes and pamphlets. All of this property was consumed by the flames except a few books that were in the hands of members. This collection of publications and insects was the accumulation of over twenty years of the Society's existence, and as the loss was only partially covered by insurance it will be a long time before it can be replaced. Some of the books, perhaps, can never be obtained again.

The Society will be exceedingly grateful for any help in the way of rebuilding the library that may be given it. Entomologists are earnestly invited to send separates of their papers or other publications that they may have in duplicate for which the costs of transmission will be gladly refunded. Until the Society is again established in permanent quarters, parcels should be addressed to the secretary at New Brunswick, New Jersey.--JOHN A. GROSSBECK, *Secretary*.

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Doings of Societies.

The second meeting of the Entomological Society of America was held in the rooms of the Boston Society of Natural History on the evening of August 22, 1907. The following members were in attendance:

Prof. John Barlow, Kingston, R. I.
Rev. Prof. C. J. S. Bethune, Guelph, Ontario.
Mr. William Beutenmuller, N. Y. City.
Mr. C. A. Blackburn, Stoneham, Mass.
Mr. F. E. Blaisdell, Berkeley, Cal.
Mr. A. F. Burgess, Boston, Mass.
Mr. Erich Daecke, Phila., Pa.
Mr. N. S. Easton, Fall River, Mass.
[illegible] Boston, Mass.
[illegible]
[illegible] Fernald, Amherst, Mass.
Prof. H. T. Fernald, Amherst, Mass.
Mr. W. L. W. Field, Boston, Mass.
Mr. C. A. Frost, South Framingham, Mass.
Mr. F. Haimbach, Phila., Pa.
Dr. Thomas J. Headlee, Durham, N. H.
Mr. J. J. [illegible], Mass.
Dr. W. J. Holland, [illegible]
Mr. C. W. Johnson, [illegible]
Prof. Vernon L. Kellogg, Stanford University, Cal.
Prof. Trevor Kincaid, Seattle, Wash.

Mr. F. E. Lutz, Cold Spring Harbor, N. Y.
Mr. H. H. Lyman, Montreal, Canada.
Mr. B. P. Mann, Washington, D. C.
Mr. C. L. Marlatt, Washington, D. C.
Prof. A. P. Morse, Wellesley, Mass.
Mr. H. H. Newcomb, Boston, Mass.
Prof. Herbert Osborn, Columbus, O.
Miss Edith M. Patch, Orono, Me.
Prof. R. C. Osburn, New York City.
Dr. F. W. Russell, Winchendon, Mass.
Prof. E. D. Sanderson, Durham, N. H.
Dr. Henry Skinner, Phila., Pa.
Prof. J. B. Smith, New Brunswick, N. J.
Mr. F. M. Webster, Washington, D. C.
Dr. Wm. Morton Wheeler, New York City.

In addition the following visitors were present:

Dr. G. Horvath, Budapest.
Prof. N. J. Kusnezov, St. Petersburg, Russia.
Prof. G. A. Severin, Bruxelles.
Dr. R. Heymons, Berlin.
Mr. F. Bates.
Prof. and Mrs. T. D. A. Cockerell, Boulder, Colo.
Mr. E. C. Cotton, Knoxville, Tenn.
Mr. W.F. Fiske, Washington, D. C.
Mr. J. Arthur Harris, St. Louis, Mo.
Mr. G. V. Pindar, New York City.
Mr. L. R. Reynolds, Boston, Mass.
Mr. A. C. Sampson, Sharon, Mass.
Mr. L. W. Swett, Bedford, Mass.
Mr. A. G. Weeks, Boston, Mass.
Mr. R. K. Wolcott, Lincoln, Neb.
Mr. Chas. Zeleny, Bloomington, Indiana.

The following were in Boston during the meetings:

Dr. R. Blanchard, Paris, France.
Dr. H. G. Dyar, Washington, D. C.
Dr. L. O. Howard, Washington, D. C.
Mr. J. E. Bates, Whitman, Mass.
Prof. A. F. Conradi, College Station, Texas.
Dr. E. A. Goeldi, Para, Brazil.
Mr. R. H. Johnson, Cheney, Wash.
Mr. J. Martin, New York State.
Mr. E. H. Forbush, Malden, Mass.
Mr. H. C. Weeks, Gilman, New York.
A. H. Kirkland, Boston, Mass.
Mr. S. Henshaw, Cambridge, Mass.
Mr. M. Wirtner, Penn Station, Pa.

In the absence of the president and first vice-president, the second vice-president, Dr. Henry Skinner, presided. He opened the meeting with words of welcome to the foreign and other guests, who were present, many as delegates to the Seventh International Congress of Zoology. Like all new movements, this society had opposition in its inception, and there were those who did not see any necessity for its existence. Only by trying it can we fairly tell the results. If there were not a demand for such an organization, few would enroll so promptly, but we already have over four hundred members. In the opinion of the speaker there are a few essential things which such a society should do; for one, to keep amateurs in touch with a central body. Now, this very object would be thwarted, were the society to consist, as some have advocated, of delegates from local societies, because by far the majority of entomologists are not in territory covered by any local society and would be unrepresented. In fact, the societies are so few and gathered into such small territory as to be by no means representative. Another great object of such a society is to build up and foster local societies in unoccupied territory. Every one is familiar with the growth of entomology in the present day. Many of us know the struggles of the older entomologists, and the discredit formerly cast upon their study. As an example of the present-day ever-growing interest, the NEWS might be mentioned (if reference to a personal subject may be pardoned,) which every year has had to be printed in increasing numbers, and already the edition for 1907 is exhausted. The society was only a natural incident to this increasing growth of entomology, and the speaker is a firm believer in its utility and wishes it a long life and great prosperity.

The Secretary then announced that the following persons had been duly elected Honorary Fellows of the Entomological Society of America:

Ezra Townsend Cresson
Philip Reese Uhler
William Henry Edwards
Samuel Hubbard Scudder
Henry Ulke
Henry Christopher McCook
William Harris Ashmead

The Secretary further announced that the following sixteen persons had been duly elected to fellowship in the Entomological Society of America:

John Merton Aldrich
William Beutenmuller
Philip Powell Calvert
Daniel William Coquillett
Harrison Gray Dyar
Charles Henry Fernald
Stephen Alfred Forbes
Samuel Henshaw

Andrew Delmar Hopkins
Leland Ossian Howard
Vernon Lyman Kellogg
William Saunders
Eugene Amandus Schwarz
James George Needham
Henry H. Lyman
James H. Emerton

Prof. Osborn stated that it was the sense of the Executive Committee by its Committee on Publication, that no attempt should be made at the publication of a journal that would occupy the field of any existing serials, and that it does not appear feasible to adopt any of the existing journals as the organ of the society. It seemed to be the sense of the Committee that a dignified publication might be undertaken in the nature of a series of Annals or Memoirs, but that this should not be done until there was no question as to the permanency of the form in which it be started.

On invitation of the President, Dr. Horvath, Dr. Heymons and Prof. Severin, and later, on the invitation of Dr. Holland, Prof. Kusnezov, responded each in turn with a brief address of greeting to the Society.

The Chair remarked that this was sacred entomological ground, hallowed by the work of Drs. Harris and Scudder. Dr. Scudder's very old friend, Dr. W. J. Holland, had been asked to bear him the greetings of the Society, and they now awaited with interest his response from Dr. Holland.

"No more grateful task, Mr. President," said Dr. Holland, "could have been imposed upon me than to carry to Dr. Scudder the salutations of the Entomological Society of America. This afternoon I made my way to Cambridge, afraid that I might not be permitted to see him, because of the tidings that reached me of his greatly failing health, standing almost as he was within the eternal shadows. What was my satisfaction to be met at the door by his sister, who said he would be very glad indeed to see me. There I found him perfectly helpless in body, but perfectly clear in mind. When I told him that I carried to him not only my own greetings, but those of the delegates to the Zoological Congress and the Entomological Society of America, he replied, 'This is delicious.' He asked me to thank the Society from the fulness of his heart for having remembered an old man, now almost a shadow of his former self."

Dr. Bethune expressed the thanks of the Society to their entertainers in Boston, and especially the Cambridge Entomological Club.

Dr. Smith offered a resolution, which was heartily concurred in, that the thanks of this Society be expressed to Mr. Kirkland for the wonderful opportunity afforded them for observing the experiments being carried on against the gypsy and browntail moths, etc., at Saugus.

There being no further business, the reading of papers was entered upon. Papers were read as follows:

Dr. J. B. Smith, "Some Unrecognized Sexual Characters of Noctuidæ," illustrated by lantern slides. The males of many Noctuidæ have characteristic tufts and hair pencils on the legs, and these reach their extreme development in the Deltoid series. Many other Noctuidæ have hair pencils, brushes and scale-tufts concealed on the abdomen, and of these little or nothing has been known heretofore. A few of the principal forms were shown on the slides.

J. Chester Bradley, "A Case of Gregarious Sleeping Habits Among Aculeate Hymenoptera." In the San Joaquin Valley, this summer, wasps had been noticed sleeping in bunches. Eight species were represented in considerable numbers, each species always grouped separately.

F. M. Webster, "Parasitism of Toxoptera." Illustrated by drawings to show the various position assumed by the larva of Lysiphlebus in parasitizing Toxoptera, and causing the latter to assume characteristic rotund form of parasitized individuals.

Discussion by Smith and Horvath.

J. Chester Bradley, "The Evolution of the Wings of Evaniidæ." Illustrated by charts. The wings of the Evaniidæ portray in a remarkable manner the progress of evolution. From a relatively complex venation we find gradual steps thus various degrees of atrophy resulting finally in the almost complete loss of venation. The group probably bi-phylletic

Discussion by Holland and Kellogg.

W. J. Devereaux, "Slight Climate and Cicindela Fauna"

Change and Extinction." In the absence of the author read by title only.

C. Abbott Davis, "Modern Methods of Mounting Insects." In the absence of the author read by title.

The meeting then adjourned to a smoker, at which the Society and its visitors were the guests of the Cambridge Entomological Club, and had a most enjoyable time.

J. C. BRADLEY, *Secretary-Treasurer.*

The April meeting of the Newark Entomological Society was held on the 14th of the month, Mr. Dickerson presiding and fifteen members present; Mr. William Erhardt, of Newark, a visitor. Mr. Rockwell spoke of using distilled water to spray the leaves of the plants, upon which he fed his caterpillars. He noted that many of the larvæ would sip the drops of water eagerly, and none died of disease so commonly noticed when breeding Lepidoptera. The inference to be drawn from this is that the bacteria and mineral matter being extracted, the water was rendered more nearly like that which the larvæ received in nature. Prof. Wormsbacher showed specimens of *Packardia elegans* and told of finding many of its larvæ on *Viburnum*. Mr. Zaiser exhibited a specimen of *Eutelia pulcherrima* that he had taken at light in Westchester County, N. Y.; also *Marasmalus ventilator,* bred from poison ivy. Of this latter species Prof. Wormsbacher remarked that it feeds on elm and the adult emerges in July. Mr. Dickerson showed a cocoon of the new Massachusetts pest, *Cnidocampa flavescens,* and spoke of its resemblance to leaf buds. Mr. Wormsbacher stated that he had seen hundreds of adult *Memythrus dollii* clustered on the branches of young poplar trees in Homestead, N. J., at the end of May and first of June.

Mr. Broadwell reported the capture of *Gymnandrosana punctidiscanum,* Forest Hill, Sept. 12; *Eucosma sombreana,* Newark, Aug. 27; *Eucosma suffusana,* Newark, June 8; *Elophila fulicalis,* Boonton, Aug. 13 and *Pyrausta orphisalis,* Atco, Sept. 8—all in New Jersey.

J. A. GROSSBECK, *Secretary.*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow, the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted.—Micro-lepidoptera, especially *Tineina.* Will give Macros or determined micros., in return. Correspondence solicited. W. G. Dietz, M.D., 21 N. Vine St., Hazleton, Pa.

I expect to have fertile ovae of *Hypercheria budleyi, H. io, A. luna, T. polyphemus, Sphinx chersis* and others for which I would like to exchange for other fertile ovae. Would prefer ovae of genus *Apantesis* or *C. regalis.*—Alfred C. Sampson, Sharon, Mass.

Wanted.—Fertile ovae of the red variety of *T. polyphemus* for experimental purposes, together with the parent moth. Cash or exchange. H. H. Newcomb, 43 Tremont St., Boston, Mass.

Extensive Series always of Hymenoptera, Hemiptera, Orthoptera, Diptera, Staphylinidae and Rhyncophora and from interesting regions, for exchange for material in the same groups from any part of the world! C. F. Baker, Estacion Agronomica, Santiago de las Vegas, Cuba.

Exchange fertile ova for same.—I expect to have *luna, io, regalis, angulifera,* possibly *budleyi* and *modesta*; I want *gordius,* [illegible] *cerisyi, abbotii, nessus, versicolor, bicolor.*—James L. Mitchell, No. [illegible] Indiana Trust Building, Indianapolis, Indiana.

Wanted.—American Lepidoptera and Coleoptera, also pupae and cocoons in exchange for European specimens with data and indentified. P. Albrecht, Berlin, O. 34, Kochhannstr. 38, Germany.

I should like to examine specimens of the Lampyrid tribe Phengodini, more especially the females and larvae. Will return specimens identified or arrange satisfactory exchange.—Herbert S. Barber, U. S. Nat. Mus., Wash., D. C.

Would like to exchange this summer the larvae or chrysalides of *Papilio* [illegible] for eggs, larvae and chrysalides of *Papilio* [illegible] have larvae of [illegible] to exchange. [illegible] 12 Miles Avenue, [illegible]

Will contract [illegible] Order or Group of insects [illegible] public institutions. [illegible] New Mexico and A[illegible]

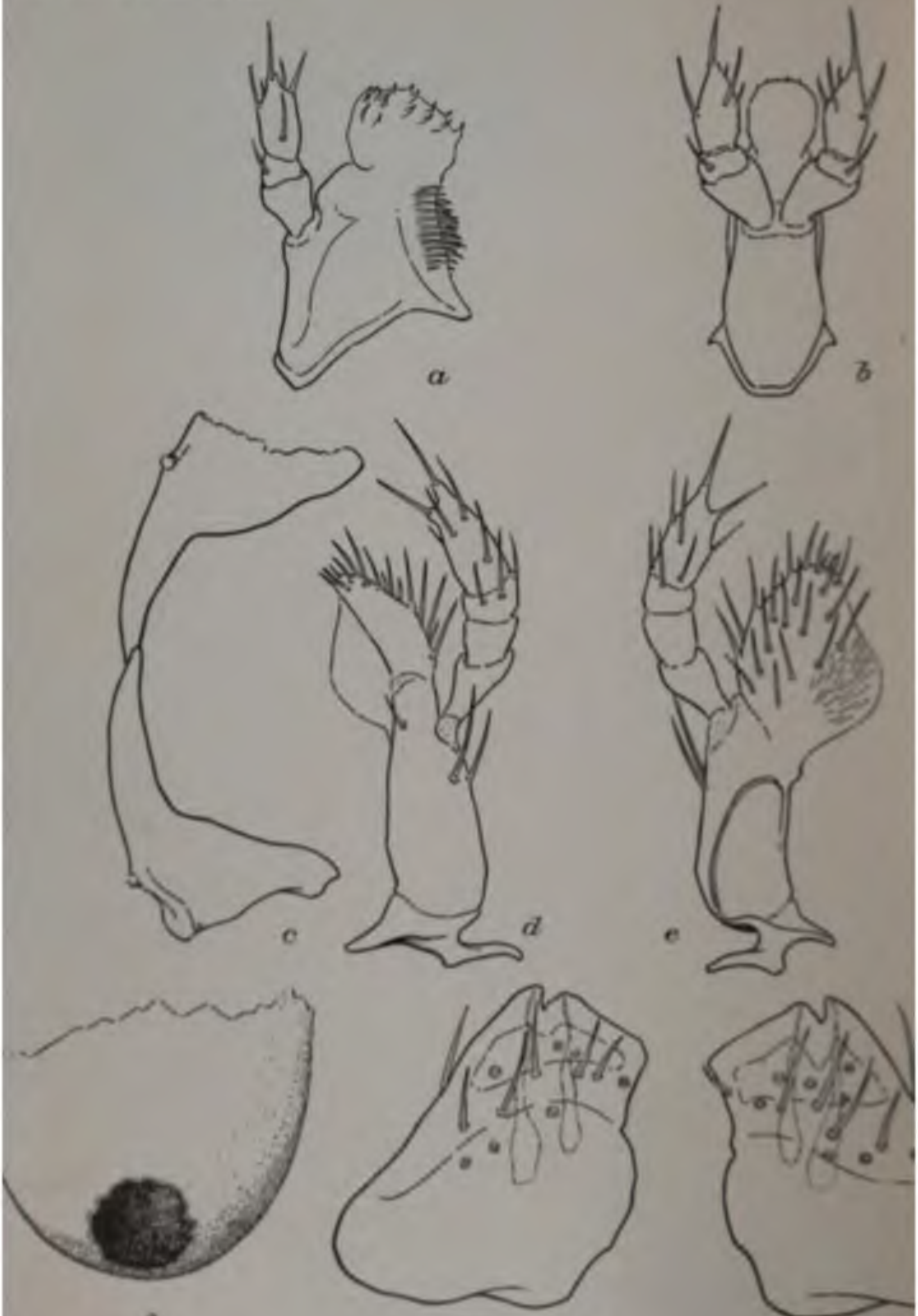
Wanted. [illegible] stamps [illegible] Reading, Pa.

Exchange or Purchase. [illegible] North American [illegible]

Orthoptera. [illegible]

Wanted [illegible] Fred C. Fowler [illegible]

Wanted for cash or exchange [illegible] specimens [illegible] Natural Science [illegible] Ave., New York.



IXODIPHAGUS TEXANUS HOWARD.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XVIII. NOVEMBER, 1907. No. 9.

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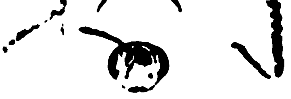
A Chalcidid Parasite of a Tick.

By L. O. Howard.

(Plate XIV)

Although the Chalcidoid parasites of the family Encyrtidæ have varied hosts, none has ever been recorded from any but a true insect, and even in the Insecta the field is rather definitely limited. In fact, there seems to be no record that any Hymenopterous parasite has ever been reared from an Ixodid, although some are known to breed in Araneids. On March 15, 1907, however, Mr. J. D. Mitchell, of Victoria, Texas, sent to the laboratory of the Bureau of Entomology of the United States Department of Agriculture, at Dallas, Texas, a number of specimens of *Haemaphysalis leporis-palustris,* collected on a cottontail rabbit in Jackson County, Texas. These included two nymphs and numerous adults. The nymphs were placed in a pill-box by Mr. W. A. Hooker to obtain data regarding the time from dropping to molting. The bottom of the pill-box was perforated with a pin and placed on moist sand in a petri dish. On May 1st the box was examined, and six Hymenopterous parasites, all dead were found. A large hole, considered to be an emergence hole of parasites, was noticed in one nymphal tick. On the same day Mr. Mitchell sent in a number of specimens of the same tick taken alive from a jack rabbit in the same county. There were several nymphs in this lot, and these were placed in a pill-box exactly as in the other case. On May 6th this box was examined; no parasites were seen and no emergence hole was observed. But on May 8th another examination showed six specimens of the supposed parasite, all alive. As before a large hole was observed near the posterior margin of one of the nymphal ticks. The pill-boxes were carefully examined by Mr. Hooker, without finding the remains of any insects. Mr. F. C. Pratt examined the sand in the petri dish, and reported that no cast skins or other indications of the presence of insects could be found. From these circumstances Mr W. D. Hunter, in charge of the laboratory, concluded that the ticks had been parasitized while they were still on their host, or, possibly, while on the ground after transformation from the hexapod to the nymphal stage, and the parasites were sent to the writer at Washington for examination. Not perfectly satisfied with this evidence, the writer went to Dallas, and had the pierced skins of the nymphal ticks sent to Washington, placing them in the [illegible] Mr. R. F. [illegible] examina[illegible] a portion of [illegible] charac[illegible] [illegible] and [illegible]



[illegible]

[illegible] conclusive that in the [illegible] parasite of an in[illegible] will equally affect the [illegible] cattle tick is something which the writer's assistants hope to investigate should they be able to secure further living specimens. The observation is most interesting from the biological standpoint. The parasite appears to be quite new, belonging to the sub-family Encyrtinæ of Ashmead's family Encyrtidæ, but does not fit well into either of the tribes founded by him. It may be described as follows:

IXODIPHAGUS gen. nov.

Female.—Mesoscutum entire, convex, parapsidal furrows entirely absent. Mandibles broad, bidentate, with an inner chisel-shaped tooth and a canine tooth. Maxillary palpi 4-jointed, joints 2 and 3 shorter than 1 and 2. Labial palpi 3-jointed short and very stout, joint 2 very short. Hypopygium not prominent. Marginal vein punctiform; post-marginal short, shorter than stigmal which is triangular and descends at a narrow angle into the wing disk. Body robust. Head lenticular from dorsal aspect: eyes well separated: ocelli at angles of right-angled triangle, the distance of the middle ocellus from each of the laterals about equal to that of a lateral from the eye-margin; eyes faintly pubescent. Antennæ somewhat pilose, slightly club-shaped: scape slightly swollen; pedicel ob-conical, longer than joints 1 and 2 of the funicle together; funicle joints subequal in length but gradually widening from 1 to 6; club with its 3 joints visibly separated, somewhat longer than last 3 funicle joints together, and with a long lateral flattened area. Antennæ inserted just below middle of face, their bases widely separated. Antennal scrobes deep. Cheeks and lower face well rounded. Mesoscutum and mesoscutellum subequal in length; axillæ nearly meeting at tips. Legs normal.

Ixodiphagus texanus n. sp.

Female.—Length 0.8 mm; expanse 1.5 mm; greatest width of fore wing 0.2. Body black, shining, somewhat pubescent. Antennæ brown. scape yellowish, especially near base; all tibiæ and tarsi honey yellow; front femora entirely black; middle and hind femora honey yellow at either end. Head and thorax shining, coriaceous. Wings generally and very faintly infuscated; wing veins light-brown, distinct.

Described from nine ♀ specimens reared as above described from two nymphal specimens of *Haemaphysalis leporis-palustris*, one from cottontail rabbit, one from jack rabbit, collected by J. D. Mitchell in Jackson Co., Tex.

Type No. 10820 U. S. National Museum.

EXPLANATION OF PLATE XIV

Ixodiphagus n. gen. *texanus* n. sp., detailed parts

- *a*, Labium with palpus of adult, from side
- *b*, Labium with palpi of adult, from below
- *c*, Mandibles of larva
- *d*, Maxilla with palpus of adult, from below
- *e*, The same from above.
- *f*, Outline of body of *Haemaphysalis leporis palustris* showing [illegible] hole of adult Ixodiphagus.
- *g* and *h*, Mandibles of adult

◆

A new Butterfly from California.

BY HENRY SKINNER.

Thecla loki n. sp.

♂.—Expanse 27 mm. Antennae annulate black and white, tip ferruginous, club black. Upper side: Primaries pale brown, with an almost obsolete black lunule near anal angle, with some brighter colored scales above it. A long tail and a short tail each tipped with white. Under side: Primaries light brown with a greenish tinge; a mesial [illegible] edged internally with black crosses the wing but does not reach [illegible] inner margin. Secondaries same color with a tortuous mesial [illegible] from costa to inner margin edged with black. In some specimens [illegible] varying in others. Space outside of mesial [illegible] the space from costa to inner margin [illegible] black spots, a black spot between [illegible] margin is [illegible]

From five specimens taken by Mr. W. S. Wright at Mt. Springs, San Diego County, Cal., July [illegible]

This species is allied to *[illegible]* and [illegible] separated from them by the difference in the [illegible] and black spots which runs from the costa [illegible] In the other species this band of spots [illegible] the middle of the outer margin.

Contributions to the knowledge of Rhynchophora.

By W. Dwight Pierce, U. S. Bureau of Entomology.

(Paper No. 1, Part II.)

BARINI.

BARIS Germar.

Baris xanthii n. sp.

This species runs in Major Casey's table for the species of *Baris* to dichotomy 12. The legs are black, the integuments highly polished with a more or less pronounced æneous lustre; beak at least two-thirds as long as the prothorax. The species is considerably smaller than *B. lubrica*, has the beak proportionately longer, and the base of the thorax slightly constricted, instead of straight as in *lubrica*. Oblong-oval, rather slender, convex, black throughout, highly polished, with æneous lustre.

Head obsoletely punctured; the beak with elongate shallow punctures in longitudinal lines, arcuate, robust, basal transverse impression distinct; antennæ shorter than the beak, club fully one-third the entire length of the antennæ.

Prothorax scarcely one-third wider than long; sides slightly constricted at base, feebly arcuate to apical fourth, thence strongly convergent and nearly straight to the apex, base not more than three times as wide as head, feebly concave from sides to the truncate apex of the median basal lobe; disk without an impunctate area, punctures moderately coarse, smaller at apex, sparse, rather shallow, placed on a surface very minutely punctate, about one-third the width of the scutellum, and separated by distances greater than their own diameters.

Scutellum subquadrate.

Elytra more than one-third longer than wide, less than twice as long as the prothorax, and wider than the latter at the humeri; sides behind the humeri very feebly convergent, the apex broadly rounded; disk with moderately coarse, deep, abrupt, finely remotely crenulate grooves, the intervals at least twice as wide as the grooves, flat, each with a series of very small indistinct, moderately distant punctures which are indifferently and irregularly placed on all intervals and confused on the third and all beyond the fifth; setæ minute silvery.

Abdomen finely, sparsely punctured, the setæ of the under surface very fine, but pale and distinct. Legs very short, moderately robust, black, finely and distinctly punctured. Length 3.3 mm.; width 1.5–1.6 mm.

This species was described with the type and five topotypes of *B. lubrica* for comparison and the two appear very

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Extensive Series always of Hymenoptera, Hemiptera, Orthoptera, Diptera, Staphylinidae and Rhyncophora and from interesting regions, to exchange for material in the same groups from any part of the world.—C. F. Baker, Estacion Agronomica, Santiago de las Vegas, Cuba.

Exchange fertile ova for same.—I expect to have *luna*, *io*, *regalis*, *angulifera*, possibly *budleyi* and *modesta*; I want *gordius*, *luscitiosa*, *cerysii*, *abbottii*, *nessus*, *versicolor*, *bicolor*.—James L. Mitchell, No. 212 Indiana Trust Building, Indianapolis, Indiana.

Wanted.—American Lepidoptera and Coleoptera, also pupae and cocoons in exchange for European specimens with data and indentified P. Albrecht, Berlin, O. 34, Kochhannstr. 38, Germany.

I should like to examine specimens of the Lampyrid tribe Phengodini, more especially the females and larvae. Will return specimens identified or arrange satisfactory exchange.—Herbert S. Barber, U. S. Nat. Mus., Wash., D. C.

Would like to exchange this summer the larvae or chrysalides of *Papilio ajax* for eggs, larvae and chrysalides of *Papilio cresphontes*, *troilus*, *philenor*, *palamedes*. Shall also have larvae of *Thyridopteryx ephemeraeformis* to exchange F. R. Miller, 9112 Miles Avenue, Cleveland, Ohio.

Will contract to collect any Order or Group of insects this season for private collections, museums, colleges or any public institutions. Duplicates for sale of all Orders from Colorado, New Mexico and Arizona.—Ernest J. Oslar, Abbott P. O., Denver, Colo.

Wanted. A good collection of postage stamps issued before 1900. Offer for same a fine long series of diurnal Lepidoptera, first-class specimens. Levi P. Mengel, Boy's High School, Reading, Pa.

Exchange or Purchase. Wanted potato beetles Chrysomelidae in large numbers from different States of North America, also large showy tropical beetles and brilliant Morphos. Adolph Mares, 1296 So. Homan Ave., Chicago, Ill.

Orthoptera. Coll., exch. G. M. Bentley, Knoxville, Tennessee, care University of Tenn.

Wanted *Pachybrachys*. I am trying to unsnarl the species of this genus and need much larger series than I now have. I will buy specimens from any part of North America. Fred C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted for cash or exchange. Large and showy North American insects of all orders, beneficial and noxious insects, specimens illustrating life histories. Write to Dept. Natural Science, The Kny-Scheerer Co., 225-233 Fourth Ave., New York.

use of the characterization of genera by Major Thomas L. Casey.* In the key following, Major Casey's numbers are used:

"1. Pygidium oblique and entirely concealed in the female sometimes with the mere apex exposed, especially in the male, except in *Centrinogyna*, where it is vertical and completely exposed in the male 17

"17. Mandibles normal in action, their plane of motion horizontal or nearly so; body without erect setae except in *Zaglyptus* . . 18

"18. Tarsi with the claws connate or single . . . 28

"28. Elytral striæ normal, distinct, not foveate at base.
"Tarsal claws two in number, completely connate in basal third to half 29

"29. Beak long, slender; body subglabrous and with remotely scattered white scales."

A. Prosternum flat between coxæ; second joint of funicle not much longer than third; elytral striae very fine but broadly feebly impressed and very coarsely punctate; body subglabrous with remotely scattered white scales . . . **Zygobaris**

B. Prosternum deeply and abruptly sulcate along the middle; second joint of funicle elongate, longer than first and also than the following joints; elytral striae deeply impressed and very coarsely punctate; body subglabrous, with remotely scattered white scales . . . . **Zygobaroides.**

"Beak short and stout."

A. Prosternum flat; body glabrous, with minute hairs in the remote punctures; antennae inserted beyond the middle; first funicular joint moderate in length; elytral striae very fine, finely and deeply punctate . . . **Zygobarinus**

B. Prosternum sulcate; body squamose; antennae inserted beyond the middle.

A. "First joint of the antennal funicle moderate in length; elytra with large remotely scattered white scales in addition to the fine squamules; species very small . . . **Catapastus**

B. "First joint of the antennal funicle very long, sometimes as long as the entire remainder; elytral vestiture often setate [illegible] denuded spots, but without widely dispersed coarser [illegible] species moderately large, more or less elongate oval, [illegible] parallel, convex . . . **Barinus**

ZYGOBARIS.

LeConte, Proc. Am. Phil. Soc. xv, 317.
Casey, Ann. N. Y. Ac. Sci. ix, [illegible]

[illegible] claws moderate in length and completely connate [illegible] of suture, through at least one-third their length [illegible]

[illegible]

Mandibles small, thick, arcuate, notched at apex and strongly decussate. Prosternum flat between coxae, separating coxae by about their own width; subapical constriction present, interrupted sternally by sublongitudinal ridges.

Subapical constriction feeble; prosternum apically with a broad median longitudinal fovea, which is prolonged on each side the coxae by a narrow sulcus; fovea and prolongations externally limited by a small longitudinal ridge; species black; vestiture not much denser ventrally . . . . **nitens** Lec.

Subapical constriction strong, medianly interrupted below by two ridges diverging toward the coxæ, between which the prosternum is slightly concave to the coxae; species brown; vestiture considerably denser ventrally . . . . **xanthoxyli** n. sp.

1. **Zygobaris nitens** Lec.

The specimen studied was collected at Key West, Florida, by Messrs. Hubbard and Schwarz in February.

2. **Zygobaris xanthoxyli** n. sp.—Considerably less robust than *nitens*, subrhomboidal, moderately convex, moderately shining, reddish-brown; integuments subglabrous, very minutely punctate, with larger setigerous punctures, the vestiture creamy colored, consisting of very minute setae, with large creamy scales remotely dispersed but more condensed beneath. The scales of the elytra are very remote and large; in the male those on the thorax below are almost as large and but little smaller on the beak, while on the abdomen they are considerably finer; in the female the scales of the beak are reduced to very fine linear squamules, those on the thorax and abdomen also being much finer than in the male. Beak long and slender, evenly, strongly arcuate, basal constriction distinct, feebly compressed and densely punctured at the sides, especially behind the antennae, one-half as long as the body in the female and five-twelfths in the male, smoother and less punctate in the female; antennae inserted at about middle in female, and slightly beyond middle in male, the scape nearly attaining the eyes, the scrobes almost completely inferior, basal joint of the funicle not quite as long as the next three, the second one-half longer than the third; club moderate, elongate-oval, densely pubescent on last three joints, with the basal joint glabrous, except for an apical fringe and composing almost one-half of the mass. Prothorax conical, one-half wider than long, the sides feebly, evenly arcuate; constriction rather strong, disk very coarsely, deeply, closely punctate. Scutellum small, oblong, glabrous. Elytra at base wider than prothorax, rather more than twice as long as the latter, parabolic in outline, the humeral callus not laterally prominent, disk with wide, moderately deep, coarsely punctate striae, intervals hardly convex, each with single series

of large shallow punctures placed behind transverse wrinkles, hardly farther apart than the punctures of the striae. Length 2.5-3 mm.; width 1.2-1.5 mm

Type ♂ and ♀, also 2 cotype ♂ and 2 cotype ♀, No. 10[illegible] U. S. N. M.; 4 cotype ♂ and 4 cotype ♀ remain in collection of Cotton Boll Weevil Investigation.

These specimens were all bred from *Xanthoxylum* berries collected by A. C. Morgan, at Runge, Texas, May 9, 1906, and Beeville, Texas, May 8, 1906.

PARASITES.

Large numbers of *Sigalphus zygobaridis* Cwfd. were bred from this weevil. The weevil larva carries the parasites under ground, evidently internally, and after forming its earthen cell the parasite devours it and spins a yellowish cocoon. The parasites come out just before the weevils.

Two or three *Catolaccus incertus* Ashm. were bred from the berries, where they evidently kill the weevil larvae and prevent their entering the ground.

ZYGOBAROIDES n. gen.

The beak is strongly tumid at the base in both sexes, although the tumidity is more pronounced and shorter in the female. Beyond the tumid portion, the beak of the female is slender, very smooth, and very sparsely punctate, while in the male it is a little stouter, longitudinally ridged and strongly punctate. The antennae are inserted in the male just behind the basal one fourth, and in the female at less than one eighth the length of the beak; the scrobes are almost inferior and reach the eyes; the scape almost reaches the eye [illegible] female being hardly more than spherical. The first and second funicular joints are both elongate and longer than the [illegible] following joints.

The type of the genus is *Zygobaroides schwarzi*.

Zygobaroides schwarzi n. sp. More robust than *Zy.* [illegible] [illegible] moderately convex, slightly shining, dark red[illegible] [illegible] integuments subglabrous, the vestiture white, consisting of very [illegible] and sparse setiform squamules with larger linear scales between. [illegible] long and slender, almost straight in female beyond basal tumidity [illegible] [illegible] in male, strongly tumid at base with the constriction [illegible] [illegible] sparsely punctate in female, but densely punctured and ridged in male beyond tumidity; tumidity in both sexes strongly pu[illegible] tate; beak one-half as long as the body in the female, and five-twelfths as long as the body in the male. Antennae as long as beak in male, but considerably shorter in female; club moderate, elongate-oval, densely pubescent, with the basal joint composing over one-third of the mass. Prosternal groove broad and deep, extending to metathorax. Prothorax conical, one-half wider than long, sides arcuate; constriction strong; disk very coarsely, closely punctate, with impunctate median line. Scutellum small, oblong, glabrous. Elytra at base wider than prothorax, rather more than twice as long as the latter, humeral callus not laterally prominent; disk with coarse striae, which are widely and deeply impressed and coarsely, closely punctate; intervals convex, each with a series of large, coarse, shallow, approximate punctures. Length 3 mm.; width 1.75 mm.

Described from 1 ♀ and 5 ♂, beaten from *Xanthoxylum* at Logansport, Louisiana, June 6, 1906, by the writer. Type ♂ and ♀ and one paratype ♂ in U. S. N. M., No. 10037, remaining paratypes in collection of Cotton Boll Weevil Investigation.

ZYGOBARINUS n. gen.

This genus is proposed for *Zygobaris coelestinus* Linell, which differs notably from the two species now included in *Zygobaris* and from the closely related species in *Zygabaroides*.

CALANDRIDAE.

RHODOBAENUS Lec.

Rhodobaenus 13-punctatus Ill.—That variety or species with the five thoracic spots, and four lateral and two median elytral spots was bred by the writer, at Dallas, Texas, from the stems of *Xanthium commune*. Larvae, pupae and adults were found in the stems Aug. 4th and 15th, and adults Sept. 11th.

ANTHRIBIDAE.

BRACHYTARSUS Sch.

Brachytarsus alternatus Say was bred in large numbers from the stems of *Sideranthus rubiginosus* at Dallas, Texas, in August. The eggs are laid in the tip of a new side stem or at the base of a flower head; the larvae feed in a small space, surrounding themselves with the brown powdery exuviæ in which they pupate. The breeding is continuous.

PARASITES.

Microdontomerus anthonomi Cwfd. (det. J. C. Crawford). One specimen was bred as a primary parasite by F. C. Pratt from material collected at Mexia, Texas, September 29, 1905.

Immature Stages of a Psychodid Fly.

David T. Fullaway, Stanford University, Cal.

The Psychodidæ have received considerable attention in America from Banks, Kincaid and others. Twelve species are listed by Mr. Banks in the East (Can. Ent. Vol. 33, p. 273), and in "The Psychodidæ of the Pacific Coast" (Ent. News, Vol. 10, p. 30), Prof. Kincaid describes, from California, Oregon, Washington, Alaska and the Pribilof Islands, ten other species, with notes on two previously described. Nothing, however, has been recorded concerning the immature stages of any of these, excepting Professor Kellogg's account of the larva and pupa of an aquatic form, *Pericoma californica* Kincaid, found in a California creek bed.

The writer, while collecting on the Stanford stock farm (Santa Clara Co., Cal.), during the 1906 Christmas holidays, found Psychodidæ in great numbers about an unused and leaky watering-trough in one of the paddocks. The ground in the neighborhood of the trough was thickly covered over with rotting straw and manure, and the water dripping from the trough had soaked through the straw, forming pools in places, and, in general, making the whole mass somewhat seepy.

The flies were present in such numbers that it was confidently hoped the immature stages might also be found, and to this end some of the manure was brought into the laboratory for examination. Both larvæ and pupæ were [illegible] and from these the adult flies were reared to be certain of their identity. The species is almost certainly *[illegible]* Kincaid, the characteristic V-shaped ventral plate of the female and caudal appendages of the male closely corresponding to the [illegible] characters in Kincaid's description [illegible]

Larva (Fig. 1, *a* and *b*) is of the same type as [illegible] by Miall and Walker (see Miall and Walker, [illegible] [illegible] Trans. Ent. Soc. London, 1895, p. 141), and [illegible] the aquatic forms described by Müller, in Brazil,* and by Kellogg, in California.† It differs, however, in some essential respects from Miall and Walker's larva, especially in the character of the last segment.

The body is pale yellowish or whitish, 4.5 mm. in length, the greatest width being .5 mm., cylindrical, and consisting of a head followed by eleven segments. Transverse constrictions subdivide the segments, the first four behind the head consisting of two annuli, the following six segments each having three. The last segment is undivided. Minute and densely crowded chitimous tubercles cover the body in all parts not wholly chitinized, and over the entire body are fine setæ, somewhat more scattered but often occurring in rows. On the dorsal surface of the ninth and tenth segments are six chitinous shields or plates, one to each annulus. These plates are heavily chitinized but otherwise are very simple.

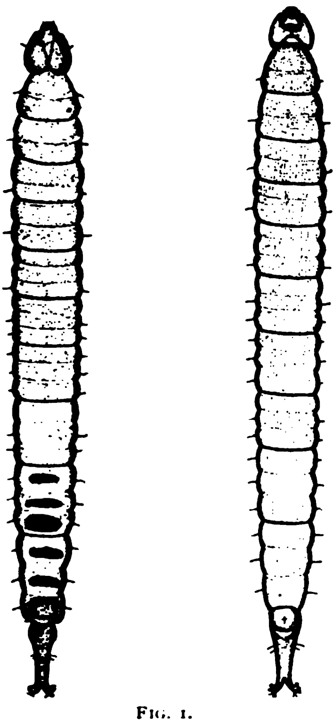

FIG. 1.

a, dorsal. b, ventral.

The head is small and strongly chitinized. Minute antennæ consisting of a group of several short rods project from the anterior portion, and on each lateral aspect is a pair of setæ, the anterior seta usually larger than the posterior one. Nothing resembling ocelli or eye-spots is apparent.

The mouth parts closely resemble those described in Miall & Walker's account and consist of jointed or flaplike appendages, all more or less setose or provided with denticulated chitinous plates, and contained in a sunken part of the ventral surface of the head. When the larva is feeding, the movable upper lip, with the long, jointed, setose appendage next it, is extended and retracted in rapid succession, and the larva probably thus provides itself with a continual supply of food.

The last segment of the body, thick at the base where it is formed into a well rounded stump ventrally, narrows toward the apex, forming a respiratory tube. The anal opening occurs on the rounded ventral surface, which has remained unchitinized. The

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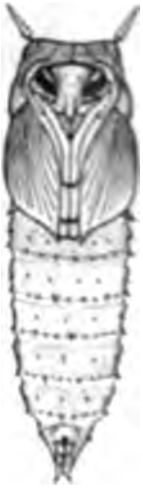
* Tr. Ent. Soc. Lond. p. 479, 1895.

† ENT. NEWS, xii, p. 46, 1901.

respiratory tube, however, is strongly chitinized, the chitinous thickening extending on the dorsal surface to the very base. The flanks of the respiratory tube bear occasional setæ, and its tip is somewhat hollowed to provide for the posterior spiracular openings of the tracheæ, two in number, which traverse the tube. From the rim of the concavity at the tip, proceed four small processes, each provided with a bunch of setæ which serve to form the cup for holding bubbles of air, whence the larva gets its supply of oxygen. An anterior pair of spiracles are borne on the first segment behind the head, occurring well back in the segment. They project from the dorsal surface as a pair of short cylindrical tubes provided with circular terminal openings.



The mode of life of the larva is closely connected with its breathing. The larva, as was said, is found especially in wet manure. If exposed to the air and deprived of the moisture which it finds in its natural surroundings, it quickly becomes dry and hard, and dies. On the other hand, if entirely submerged, *i. e.*, if its air tube is covered (the larva is unable to maintain itself at the surface), it is also killed. It is therefore confined, so far as ability to persist is concerned, to a mere film of water. The necessary conditions are evidently found in the manure beds where the larvæ were so abundant. They are usually found twisting and crawling about, worm-like, over the straw, dragging a thin film of water after them, the anal segment upraised to the surface, where a bubble forms about the [illegible] cup. The feeding process has already been mentioned. The larva does not, however, feed continuously, nor is it always in motion. It is often found coiled up, and hidden in the material on which it lives.

The pupa (Fig. 2) is [illegible] mm. long, the greatest [illegible] It resembles in general appearance [illegible] [illegible] of the Lipsidæ.

[illegible] Nine segments are visible [illegible] dorsal surface, behind the large plate (or plates) which bears the respiratory processes, but only six appear in front, the others being hidden by the forming wings and legs. The segments narrow posteriorly, terminating in a fin-like anal segment. Each segment bears on its posterior margin a complete circle of spinous processes, which perhaps assist in holding it securely in an upright position wherever it attaches itself. A pair of respiratory trumpets arise from the anterior portion of the body, consisting of two parts, a short, much crumpled pedicle and a many times longer horn, expanded at the base but narrowed toward the tip, where it ends in a number of circular foramina. A single large trachea passes through the trumpet, opening by the foramina just mentioned. The surface of the trumpets is greatly roughened by transverse folds.

The female of Protambulix carteri R. and J.

By William C. Wood, New York.

Protambulix carteri is described by Rothschild and Jordan in their recent work on the Sphingidæ (Vol. I, p. 180), the species being named from two male specimens, one taken in Nassau, N. F., Bahamas, by the late Governor, Sir Gilbert Carter, and the other from Biscayne Bay, Fla.

Having recently received from Miami, Fla., a pair of this little known Sphingid, I have thought that a description of the female might be of interest, since, so far as I know, it has not yet been described. Rothschild and Jordan's description, which is brief and confined mainly to the points of dissimilarity between *P. strigilis* and *P. carteri,* omits to state that the latter is quite different in appearance. While *strigilis* is bright, and rather vividly marked, *carteri* is dull and obscure in general appearance.

Protombulix carteri R. and J.

Fémale.—Head brown-vinous, palpi red-fulvous, eyes black, thorax, vinous above and laterally, lappets greenish brown shading off through ochraceous to dirty white at lower end; a small rubiginous patch at base of costa, and below metathoracic tuft. Antennæ a little more slender than in the male, light brown above, ochraceous below, length 13 mm. Abdomen tawny brown above, fringes of tergites vinous, vinous on sides, and yellowish below. Femora red-fulvous like palpi, tibiæ and tarsi grey. Primaries much broader than in the male (greatest breadth ♀ 19 mm, ♂ 16 mm.) the costal outline arcuate, while in the male it is slightly sigmoid. The primaries are of an even, concolorous tawny brown, several shades lighter than in the male, and without the cinereous tinge, verging on olivaceous, which distinguishes the latter. The markings are almost precisely the same; a vestigial discal line crossing the wing at outer third, a dark spot just below costa at outer third [illegible] encroaching upon the costa in the ♀, while in two ♂ specimens it does [illegible] a trace of a similar spot near apex, and several indistinct spots on basal third of costa. A dark dash on lower border just within posterior angle, prolonged as a line toward base of wing along submedian interspace. A small brown dot at base of wing, and a similar dot on [illegible] median vein a short distance from base. The edges of the primaries are very slightly darkened.

Secondaries bright tawny red, with traces of two discal lines as in the male, but much less distinct. The marginal band of the male is practically absent, except as a suffused greyish patch along inner margin above anal angle. Beneath, same as in the male. Expanse, [illegible] mm. Length of body 40 mm.

One specimen from Miami, Fla.

The female differs from the male chiefly in the form of the primaries, in their lighter, brighter color, in the lighter color of the abdomen, and in the brighter and almost immaculate secondaries. The sexes are nearly similar beneath.

My specimens, which are in fair condition, were sent me by Mr. W. S. Dickinson, who took them at flowers in the gardens of the Hotel Royal Palm, on April 15th, of this year.

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A remarkable new Phorid from Cape Colony.

[illegible] Public Museum, Milwaukee, [illegible]

Up to the present time scarcely any Phoridae have been [illegible] part of the African [illegible]

[illegible]

genus, although a number of related species have been described from Europe and North America.

Following is the description of both sexes of the species, which I have named in honor of its discoverer, who has done so much toward making known the remarkable insect fauna of the Cape.

Aphiochaeta braunsi sp. nov.

Male.—Length 2 mm. Shining black; the antennæ, palpi, and most of the legs and scutellum yellow or luteous. Wings hyaline, infuscated at the tips. Front long and polished. Head rather small, the front twice as high as wide, smooth, polished black, the vertex sharp and narrowly reflexed; one pair of approximated proclinate bristles; a reclinate one at each lower corner; next row above consisting of only one pair close to the eye margin; following row very strongly curved upward medially; upper row of four normally placed. Antennæ small, ovate, honey-yellow; arista dorsal, very finely pubescent, almost bare; apical aristal joint black. Palpi small, very stout and thick, bristly at the tips. Postocular cilia delicate, cheeks each with a single macrochæta. Eyes large, slightly pubescent; no ocellar tubercle or median frontal groove. Mesonotum subshining, black, tinged with luteous at the root of the wing; with one pair of dorsocentral macrochætæ and four strong scutellar bristles. Scutellum one-half wider than long, piceous or brownish. Abdomen very stout and thick entirely shining black, except for the honey-yellow hypopygial lamella; second segment not lengthened although it is the longest, with the following gradually growing shorter; no bristles at the sides of the second segment. Pleuræ subshining, black. Legs and coxæ luteous, tips of hind femora and four posterior tarsi infuscated. The legs are unusually short and stout, especially the posterior femora which are about one-third as broad as long, suddenly narrowed at the tip and faintly ciliate below. Tibiæ very strongly bristly, even the anterior pair with distinct setulæ; those on the middle and posterior pairs as long or longer than the diameter of the tibiæ; tibial spurs rather short. Wings hyaline, the apex with a grayish cloud; costal vein reaching slightly beyond the middle, with very fine, short and thickly placed bristles. First and third veins straight, the first twice as far from the humeral cross-vein as from the tip of the third; third furcate very near the tip, the cell thus formed very small and narrow, almost linear; first light vein straight except at the extreme base, following nearly straight; fourth light vein distinct. Both the heavy and light veins are black or very dark piceous. Halteres pale.

Female.—Larger, 3.5 mm, but otherwise differing only slightly in color. The side margins of the mesonotum behind the insertion of the wing and most of the scutellum are luteous, while the fourth and fifth abdominal segments except the anterior corners of the fourth are orange-yellow. The wings are very long and narrow in both sexes.

Described from two specimens, male and female, taken in copula, Willowmore, Cape Colony, February 5, 1907 (Dr. Brauns).

Concerning their habits, Dr. Brauns writes that he found them in burrows in an old willow stump frequented by Cerambycidæ, where the large carpenter-bee, *Xylocopa caffra* was also nesting.

The species is quite distinct from any known to me. It falls near a small group of other species like *A.* [illegible] M. & B., *A. longifrons* Brues, *A. xanthozona* Strobl, etc. The legs are stouter than those of any member of the genus that I have seen, recalling those of *Hypocera* or *Phora*.

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A new species of Termes.

By NATHAN BANKS.

Around Washington, D. C., there are two species of *Termes* that have posed as *T. flavipes*. The male of one is a larger darker species and flies earlier in the Spring. This appears to be the true *T. flavipes*, according to the short description of Burmeister. The *Termes frontalis* Haldeman is this same species, the colors, size and time of appearance of male agreeing with this form. The other species I shall call *Termes virginicus*. The two species may be separated by the following description.

Termes flavipes Burmeister.

[illegible]

Termes virginicus n. sp.

[illegible] Length 7.5 to 8 mm. [illegible]

Soldier.—Head twice as long as broad; and the antennæ and mandibles scarcely as long as width of the head.

The male is readily separated from *T. flavipes* by its smaller size, paler color, paler wings; and the soldier by its more elongate head; both forms being more slender throughout than *T. flavipes*.

The new species I have taken from Falls Church and Chain Bridge, Va., and from Washington, D. C. The *T. flavipes*, I have from Falls Church, Va., Washington, D. C., Angelsea, N. J., and Sea Cliff, N. Y.

Two new species of Perdita (Hymenoptera).

By H. L. Viereck.

Perdita bradleyi n. sp.

♂.—In size and structure very much the same as *octomaculata*, in color more like *monardae*, in sculpture this differs from both of the preceding. Dorsulum highly polished, with rather widely separated and somewhat inconspicuous setigerous punctures. The scutellum and postscutellum are shining with scattered setigerous punctures, the pleura are in structure very like the scutellum; Metathorax shining, smooth and seemingly impunctate; abdomen shining, with widely separated setigerous punctures; dark portion of head dullish, the yellow portion polished, the entire surface with sparse setigerous punctures. Color: head and thorax mostly dark and metallic; the dark portion of the head and metathorax bluish the same portion of the rest of the thorax greenish; dorsum of abdomen mostly brown, seemingly black at base and near the apex; the lower half of the face and a little more also the front of the scape are lemon-yellow, as are the tubercles and an interrupted band on the pronotum. Longitudinally half of the flagellum is orange yellow with a brownish cast; anterior and middle legs and venter of abdomen almost exclusively lemon yellow; the posterior legs are partly yellow and partly brown as follows: Coxae with the greater portion of the upper half brown, more than half of the outer side of the femora brown, and the outer side of the tibiae entirely brown. There is a slender interrupted band of yellow along the apical margin of the first dorsal abdominal segment and a similar band at base of the fifth, as well as the fourth, dorsal abdominal segment. In addition there is a similar band at base and apex of the second and third dorsal abdominal segments. The wings are practically colorless, excepting for the nervures and the stigma, the former being dark brown along the costa and pale brownish, rather brownish testaceous elsewhere, the latter being translucent testaceous. The left wing has three submarginal cells by virtue of the first transverse cubitus forking near its base where it joins the cubitus. In the right wing there are but the normal (for this genus) two submarginal cells.

Type in the collection of the Acad. Nat. Sci. Phila., Penna. Type locality, Clementon, N. J.

The seven examples of this species before me were taken at type locality May 24, 1902, by my friend, Mr. J. Chester Bradley, in whose honor the species is named. Most, if not all of the specimens cited, have three submarginal cells in one or both wings in the same way as in the type, though in some specimens the forking takes place nearer the middle than the base of the nervure; the sculpture and color in the paratypes is practically the same as in the type.

Perdita novae-angliae n. sp.

♀, ♂.—In structure, sculpture and size almost the same as *bradleyi*; in color it differs very markedly from this and its only ally in the Alleghanian Zone—namely *octomaculata*.

According to Ashmead's "Classification of the Bees," this is an atypical *Macroteropsis*, differing in having the head longer than broad at least in the ♀ and in the labial palpi of the ♀ and ♂, having the first joint as long as or shorter than the succeeding joints combined.

♀.—Lower half of face is somewhat more polished and very sparsely punctate, with very indistinct setigerous punctures that become discernible only under a high power lens; *e. g.*, one that magnifies 15–20 diameters. The rest of the head shining, with more conspicuous and numerous setigerous punctures. Thorax in structure of tegument very like the upper half of the face, with the exception of the enclosed space of the metathorax, which looks bare and is apparently impunctate. Abdomen mostly appearing bare, the apical half of the venter and the [illegible] being rather closely pubescent. All hair whitish; both wings have three submarginal cells on account of the forking of the first transverse cubitus which takes place between its junction with the radius and its middle. Color. Head and thorax mostly metallic greenish, the lower half of the face and somewhat more, in fact, the highly polished portion of the face is blackish except for a brownish tinge along the anterior margin of the clypeus and a yellow mark on each side of the face near the junction of the eye and mandible, a yellow longitudinal band on the clypeus and mostly brown mandibles that are yellowish at base, wings practically colorless, the stigma and nervures, with the exception of the subcostal nervure which is brown, are slightly tinted with testaceous. The abdomen is mostly blackish, with the extreme apex brownish and the margin of the penultimate dorsal segment whitish testaceous. The second and third dorsal abdominal segments with a widely interrupted yellow band

Antennae mostly dark brown, with the exception of the scape which is yellow anteriorly; legs blackish with the exception of the anterior tibiae in front where they are yellow, and the tarsi which are mostly yellow.

♂.—Practically the same as the ♀ differing only in ornamentation, having in addition to the yellow marks of the ♀, a yellow mark on each side of the clypeus, a yellow labrum—this member being brown in the ♀ and a yellow stripe on the anterior aspect of the middle tibiae. The abdomen is immaculate.

Type.—♀, Coll. Agl. Expt. Sta., New Haven, Conn.

Type.—♂, Acad. Nat. Sci. Phila., Pa.

Type locality, Poquonock, Ct.

One specimen, the ♀ type was collected by the writer in the type locality June 27, 1905. Two males were taken at Hyannis Point, Mass., July 4, 1904, by Mr. C. W. Johnson; thus, according to our present records, this is clearly an Alleghanian species.

Notes on Some Bees Collected by Mr. H. L. Viereck in New Mexico in 1902.

By T. D. A. Cockerell.

The bees treated herein are from the expedition sent out by the Philadelphia Academy of Natural Sciences in 1902, and are the property of that institution.

Xylocopa californica arizonensis (Cress.) var. a.

♂.—Clypeus with a cream-colored spot; clypeal keel reduced; first abdominal segment with hardly any hair.

Alamogordo, May 30.

Anthophora petrophila (Ckll.).

Alamogordo, May 3, 1 ♀. New to New Mexico. The hair of the vertex and thorax above is white, not mixed with black.

The male, not hitherto described, has been found by Dr. Davidson at or near Los Angeles. In my table of *Micanthophora* (Trans. Am. Ent. Soc., xxxii.) it runs to eight, and runs out because the fifth and sixth abdominal segments appear black, contrasting with the others because lacking the white tomentum. Thus it appears to run close to ♀ *A. flexipes*, but it is very distinct from male *flexipes* by the normal middle tarsi. The flagellum is bright ferruginous beneath; scape yellow in front; clypeus with a broad yellow band; mandibles strongly bidentate; labrum yellow, with the usual dark spots, its lower edge with a little median notch, and a broad shallow excavation on each side of it; end of abdomen with a pair of short, blunt, light ferruginous teeth, and very short dark lateral spines.

Anthophora curta Provancher.

Alamogordo, May 7 to 15, many of each sex; Highrolls, June 11, ♀s. This excellent series led me to go over the whole of the available material of *curta* and its varieties, with the result of finding that *A. curta peritomae* Ckll. (Ent. News Oct. 1905) is a perfectly distinct species. In the male of genuine *curta*, there is at the apex of the abdomen a long plate broad basally, and narrowed apically, where it is truncate The lateral spines are strongly developed and black. In male *peritomae* the abdomen ends in a pair of short light ferruginous spines, so that with the slender dark lateral spines the abdomen is quadrispinose. In the females, the difference is not so obvious, but the hair on the inner side of the hind basitarsus is very dark brown or almost black in *A. curta*, [illegible] ferruginous in *A. peritomae*. The yellow clypeal band is [illegible] broad, and extends practically to the eyes in *A. curta*, [illegible] *A. peritomae* there is usually a wide interval between the [illegible] and the orbital margins, while in the middle it sends [illegible] spicuous pointed process upwards, this being usually absent [illegible] *curta*. The marginal cell of *curta* is very short; in [illegible] it is more produced apically.

A. curta in my collection comes from San Pedro, California, July [illegible], a male peculiar for having the clypeus all [illegible] (Ckll.); Juarez, Mexico, May 12 (Ckll.); Las Cruces, N. M., male Aug. [illegible], at flowers of *Wislizenia* [illegible], female May 12, at [illegible] (C. H. T. Townsend); Mesilla Park, N. M., males, Aug. 14, at plum flowers, Sept. 17 at [illegible] (Ckll.). I find no specimens from Northern New Mexico or Colorado.

A. peritomae (typical) comes from Las Cruces, N. M., males at *Solidago canadensis*, end of August (*Townsend* and *Ckll.*), females at *Helianthus annuus*, Sept. 21–22 (*Ckll.*); Mesilla Park, N. M., at flowers of *Isocoma wrightii*, Sept. 11, male (*W. Porter*); Pecos, July 15 (*W. P. Ckll.*); San Ignacio, Sept. 1 (*Porter* and *Ckll.*); Embudo, September 27, females at *Chrysothamnus* (*Ckll.*); Rociada, August 20 (*W. Porter*); Santa Fe, August, male at *Chrysopsis* (*Ckll.*);—all these localities in New Mexico.

Alamosa, Colorado (*Johnson*). There is a very evident preference for the yellow-flowered Compositae. The range is from the Transition Zone to the Middle Sonoran, in the latter overlapping that of *curta*.

Two varietal forms of *peritomae* may be recognized :

(*a*) var. *interspersa*. Male, with much black hair interspersed on vertex and mesothorax. The type is the male from Alamosa, reported in ENT. NEWS, Oct., 1905, p. 272, as *curta*. Another is from Rociada, N. M., at flowers of *Grindelia nuda*, Aug. 8 (*W. P. Ckll.*). Specimens from Santa Fe, July, and Las Cruces (one of these obtained by Townsend from *Solidago canadensis*, Aug. 27) are intermediate between *interspersa* and typical *peritomae*.

(*b*) var. *tinctula*. Light hair of vertex and thorax above, fulvous instead of white, in the female, with much black hair interspersed, in the male with few dark hairs. The type of *tinctula* is a ♀ from Rociada, at flowers of *Grindelia nuda*, Aug. 8 (*W. P. Cockerell*); others are from Las Vegas, at flowers of *Grindelia nuda*, Aug. 10 (*S. L. Miza*); Las Vegas, *Verbesina exauriculata*, July 31 (*Ckll.*); and a male from Santa Fé, August, at *Peritoma serrulatum*.

Melissodes tristis Ckll.

Alamogordo, May 13, 1 ♂; Highrolls, May 30–June 14, 4 ♂.

Melissodes pallidicincta Ckll.

Highrolls, May 30, 1 ♀; Cloudcroft, June 16, 1 ♀; Alamogordo, June 7, 1 ♀. This is probably the female of *M. tristis*. Mr. Viereck also took *M. gilensis* Ckll. at Cloudcroft, June 16, ♀.

Nomada ruidosensis Ckll.

Cloudcroft, June 16, 1 ♂. In this specimen the first abdominal segment has a couple of transverse yellow lines (rudiments of a band), and hence in my table of Rocky Mountain *Nomada* (Bull. 94, Colo. Exp. Sta.) it runs to *N. pallidella* Ckll.; but that species has yellow spots on scutellum, and much more yellow on first abdominal segment; the yellow color also is pale, not bright as in *ruidosensis*.

Prosopis basalis Smith.

Cloudcroft, May 27, 1 ♂. A boreal species.

Alamogordo is in the Middle Sonoran Zone, with a desert fauna characteristic of the southwest, some members of it extending to Southern California (as *Anthophora petrophila*) or even the Pacific coast region of Mexico (as *Perdita townsendi*). Within a few miles, it is possible to ascend through the Upper Sonoran and Transition into the Canadian Zone, where, as at Cloudcroft, some typically boreal species occur. Thus the region is one of extraordinary interest and would be well suited for the establishment, preferably at a fairly high level, of a small permanent biological station. It may be added that the Sacramento Mountains afford, in addition to well-known boreal and subboreal species, a fine series of endemic forms.

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ON June 26, 1907, just at dusk, as I was walking in my garden, I noticed two sphinges hovering over the bed of pinks. I took them to be *Amphion nessus*, and was inclined to go on with my work. On second thought, however, I secured my net and captured both specimens. A later examination of them showed one to be *A. nessus*, but the other to my delight was *Sesia titan* ♂ Cramer, as figured in Holland's moth book.

Looking up other lists I find a variety of opinions as to the genus *Aellopos*. Holland gives *Sesia titan*, *tantalus*, *fadus* as three different species. Dyar gives *Aellopos tantalus*, Linnaeus syn. *titan*, Cramer. Smith's old list gives *Aellopos fadus* syn. *titan*, and gives *tantalus* as a different species. Smith's new list gives *Aellopos tantalus* Linn., and makes no mention of *titan*. I have two specimens sent me from Southern California under the name of *Aellopos tantalus*, which are smaller than the specimen I took, and they have only one white bar on fore wings instead of two, like Holland's illustration. "Who shall decide when doctors disagree?" Has anyone taken this species so far north?"—W. F. LONGLEY, Oak Park, Illinois.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., NOVEMBER, 1907.

The International Entomological Congress. A plan has been inaugurated to establish such a congress to meet for the first time in the year 1908. The purpose of the Congress is to promote the interests of entomological research and of biology in general by furthering the cordial co-operation between the entomologists of the different countries, stimulating research and directing it into channels where it may be most needed. We firmly believe that the meeting of entomologists of various nationalities can accomplish great good. The acquaintanceship and social intercourse alone would be of great benefit. This was well illustrated during the Zoological Congress. It was a great pleasure to meet entomologists from Europe and exchange ideas and find out what splendid fellows they were. We knew their work and reputations; but now we look upon them as personal friends in addition. We sincerely hope those promoting the International Entomological Congress will go on with the work and make the first meeting a great success. From the list of names of those advocating it, success would appear assured.

A NEW PARASITE OF THE DOMESTIC FOWL.—Last month Charles Euler, one of my students, brought in a peculiar mallophagid which he had found on a domestic fowl in Boulder. I turned to Professor Kellogg's papers, expecting readily to determine it, but could not make it agree with anything from *Gallus*, and so sent it to Professor Kellogg himself. He kindly informs me that it is *Lipeurus docophoroides* Piaget which was discovered by Piaget on California partridges, *Callipepla californica*, in the Zoological Garden of Rotterdam. Professor Kellogg has taken it on the same bird, wild, in California; but it has not hitherto been reported from any domestic gallinaceous bird.—T. D. A. COCKERELL.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

ENTOMOLOGIST APPOINTED FOR AGRICULTURAL COLLEGE EXPERIMENT STATION.—A New Department for the Study of Injurious Insects—Farmers, fruit growers, truck gardeners, and in fact all who are interested in agriculture in North Carolina should be interested to learn that the A. & M. College and Experiment Station has established a *new department for the teaching and study of insects.* This is not a new line of work for the State, as the State Entomologist of the Department of Agriculture at Raleigh has, for a number of years, conducted the work of the inspection of orchards and nurseries, and undertaken investigation and control of certain injurious insect pests. There must be, however, many problems that the State Entomologist has not, and may not, be able to undertake.

The new entomologist, R. I. Smith, at the A. & M. College and Experiment Station at West Raleigh comes from Georgia, where he held the position of State Entomologist for a number of years.

NOTES ON THE CHIRONOMIDAE.—In Bulletin 86 of the New York State Museum, p. 125 (1905), I proposed the name *Ablabesmyia* for those species of the genus *Tanypus* Meigen, which have hairy wings and a sessile cubitus (Comstock) as in *monilis*, and retained the name *Tanypus* for those species having hairy wings and a petiolate cubitus, as in *punctipennis*. But since Skuse, in 1889, subdivided Meigen's genus and restricted the name *Tanypus* to the first group, and furthermore as Fries [illegible] Curtis, and others had already given *monilis* as the type of *Tanypus*, I now consider that I was in error and therefore propose the following:

(1) *Pentaneura*, new name, type *punctipennis*, with *Tanypus* as [illegible] by me 1905 and restricted by Kieffer 1906 as a synonym.

(2) *Tanypus* Meigen (part), type *monilis*, with *Ablabesmyia* [illegible] sen and *I[illegible]* Skuse, as synonyms.

I [illegible] Skuse is a synonym, because the characters [illegible] author in defining it are somewhat variable. The name [illegible] preoccupied for Coleoptera.

[illegible] Kieffer is a well marked genus. The retracted [illegible] of the M-Cu cross vein, as well as other characters, will at once distinguish it from all other *Tanypinae*. *T[illegible]* I understand [illegible] is the type. I have a specimen taken at Ithaca, N. Y.

[illegible] probably *P[illegible]* Staeger, was sent to me from [illegible] Cockerell. This is the first record of the occurrence [illegible] in North America.

I have taken both male and female specimens of [illegible] during the summer at Ithaca, N. Y. [illegible] seen in great swarms hovering among the shrubbery overhanging a little creek. The statements made by Kieffer Genera Insec torum, Chironomidae) regarding the wing venation agree with my own observations. R, and the basal part of the costa are much thickened, but the costal cell is not quite obliterated. It is only when the wing is held slightly oblique that it appears as shown in Winnertz's figure (*Stettiner Entomologische Zeitung*, 1846).

There are several North American species of *Orthocladius* which possess hairy eyes, but the males have normal antennae and therefore differ in this respect from Kieffer's subgenus *Trichocladius*.—O. A. JOHANNSEN.

ALTHOUGH the collecting season in the vicinity of St. Louis, Mo., gave poor promise this year, owing to heavy frosts and icy nights succeeding an extraordinary warm spell in March, late summer and fall proved a collector's bonanza. Quite a number of *Terias mexicana* were taken in this locality for the first time since 1904, when they were quite common. *T. nicippe*, usually abundant, was very scarce. *Papilio philenor* was hardly in evidence until September, when exceptionally fine specimens were to be had in plenty. *Chlorippe celtis* and *C. clyton* were never before, in the writer's experience, so abundant. At the present time (October) the woods about here fairly swarm with *Paphia andria*, several freaks of this species having been taken recently. *Thymelicus brettus* and *T. aetna* were taken here this season and should be added to the "list of butterflies taken in the vicinity of St. Louis," as published in the July number of the ENTOMOLOGICAL NEWS.—AUG. KNETZGER.

NOTES ON POLYGONIA CHRYSOPTERA WRIGHT.—Mr. Victor L. Clemence and the writer discovered this species in the West Fork of the Big Santa Anita Canón, along the Sturdevant Trail, in the San Gabriel Mountains, near Pasadena, California, on June 19 of the past summer, at an elevation of 2500 feet. Only three specimens were taken on this occasion, the interesting character of the species not being particularly noticed. Another trip by the writer on the twenty-ninth of June was productive of eight more specimens.

This is the first time that this species has been collected in this part of the State, and it has only been seen in this restricted locality. This canon is large and overgrown with rank vegetation, with plenty of nettles (*Urtica*), and a stream, making an ideal place for such a group of butterflies. It is confidently expected that later in the season larvæ will be found.

Polygonia chrysoptera was described by Wright in his "Butterflies of the West Coast," p. 174-175, Pl. XXII, Fig. 222, b, c. My series of eleven specimens agree very well with those described by Wright. The black markings on the upper side are rather more intensified; but the underside is remarkably constant, and the most characteristic diagnostic character for the species. The character of the silver *C*, long, slender and barbed at both ends and the generally light color mark this species sharply from any other Californian species of *Polygonia*, and as remarked by W. G. Wright, this is the largest of our West Coast Polygonias—FORDYCE GRINNELL, JR.

I WISH to report an immense army of migrating *Anosia Plexippus* (Linn.) that passed through here this afternoon (Oct. 4th), going southward. The swarm of butterflies was about one and one-fourth miles wide, and I do not know how long, as they had been flying past for some time before I saw them, they continued to fly for about fifteen minutes after I saw them.

The majority were flying at about the height of the telegraph wires.

Occasionally one or two would drop from the main army and settle in the mud of the street for a few moments—possibly for refreshments—and for a while there were hundreds in the streets, but within a half hour they were all gone.

Their flight was not a swift one but was very steady. They had the appearance of being weary, for they would fly for a short while, then soar.

There were probably millions in this swarm and I could not help comparing them to the flights of the passenger pigeons of which I have read.—B. R. BALES, Circleville, Ohio.

PROF. C. F. BAKER wishes to announce that his address after November 1, 1907, will be Museu Goeldi, Para, Brazil, and that all letters and packages should be forwarded to him at that point.—C. F. BAKER.

Entomological Literature.

EVOLUTION AND ANIMAL LIFE.—An Elementary Discussion of Facts, Processes, Laws and Theories relating to the Life and Evolution of Animals. By David Starr Jordan, President of Leland Stanford Junior University, and Vernon Lyman Kellogg, Professor of Entomology and Lecturer in Bionomics in Leland Stanford Junior University. New York: D. Appleton & Co. 1907. 12mo. pp. xi, 489 298 figures in the text, and three colored plates [of birds] Cloth, $2 50 net.

In a prefatory note the authors say: "The book is composed primarily of the substance of a university course of elementary lectures delivered jointly by the authors each year to students representing all lines of college work. . . . . the authors feel that the interested general reader will find this small volume a fairly comprehensive introduction to our present-day knowledge of the factors and phenomena of organic evolution."

The following list of the titles of the chapters will show the order and manner in which evolutionary themes are treated. I. Evolution Defined; II. Variety and Unity in Life; III Life, its Physical Basis and Simplest Expression, IV. Factors and Mechanism of Evolution; V. Natural Selection and Struggle for Existence: Sexual Selection; VI. Artificial

Selection; VII. Various Theories of Species-Forming and Descent Control; VIII. Geographic Isolation and Species-Forming; IX. Variation and Mutation; X. Heredity; XI. Inheritance of Acquired Characters; XII. Generation, Sex and Ontogeny; XIII. Factors in Ontogeny and Experimental Development; XIV. Paleontology; XV. Geographical Distribution; XVI. Adaptations; XVII. Parasitism and Degeneration; XVIII. Mutual Aid and Communal Life among Animals; XIX. Color and Pattern in Animals; XX. Reflexes, Instinct and Reason; XXI. Man's Place in Nature.

It is all clearly and interestingly told, with every here and there a happy phrase, such as "Natural selection does not create species, *it enforces adaptation*" (p. 63), or "It may be said that the inside of an animal tells what it is, the outside where it has been" (p. 174). The arguments for and against each theory of species-forming are briefly and impartially stated. The most valuable feature is the explanation of the fundamental characteristics of recent biological advances and their relations to evolutionary problems frequently referred to in the literature of to-day, such as fluctuating variations and Quetelet's law (p. 140), the theory of the purity of the germ cells as an explanation of Mendelian inheritance (p. 191), the significance of the chromosomes in inheritance (pp. 252-275) (but nothing of chromosomes as possible sex-determinants). It is not always easy to lay one's hand on simple explanations of such subjects.

The examples cited in the book are both old and new. If our old friend, Darwin's elephant, "the slowest breeder of all animals," again greets us (p. 60), we are refreshed with the symbiosis of the Aztec ants and the imbauba tree (p. 378). The egg-laying of the quinnat, or king salmon, is a favorite with the authors, as it is described three times (pp. 59, 342, 439), and twice (pp. 39, 343) do frozen Alaskan fish, fed to Esquimaux dogs, thawing, make their escape from the stomach alive, although one does not learn all this from the index.

It is of special interest in this place to mention that insects and entomological works are largely drawn on for illustration. We naturally expect this, since the junior author is a distinguished entomologist. Thus, the one definition of species quoted (pp. 12, 13) is that of Rambur; much of chapter IX is drawn from the studies of Kellogg and Bell on Coleoptera and Hymenoptera, while XVIII and XIX are largely entomological. Many interesting insects are figured throughout the book.

Pages 471-475 comprise an Appendix consisting of "references to general and special treatments of the subjects included in this book, arranged according to chapters. These references are confined to books and papers published in English . . . . [and] . . . . are mostly not to original papers, but to manuals, summaries and digests of evolution subjects." Many of the chapters contain quotations from authors other than those listed in this Appendix and we think that even "general readers and elementary students" would often like to know where to find the context of the citations.—P. P. C.

THE DECTICINAE (A GROUP OF ORTHOPTERA) OF NORTH AMERICA. By Andrew Nelson Caudell. Proc U. S. National Museum, XXXII, pp 385-410, ninety four figures

The interesting paper bearing the above title can justly be considered one of the most important recent contributions to systematic North American Orthopterology, based as it is on the examination of a great amount of type material, as well as a series of specimens of the group far in excess of that examined by any previous student of the Decticinæ of our continent At best a difficult and puzzling group, the American forms of the Decticinæ present in several cases problems which are more than usually abstruse, and we believe the present work solves these problems much more satisfactorily than any thing which has preceded it

The author recognizes twenty genera, fifty nine species and ten varieties, of which four genera, twenty one species and seven varieties are described as new. The character of the armature of the anterior tibiæ which was an important character in Scudder's key to the group published a decade ago, is said to be most unreliable, and the cerci of the male are found to furnish valuable characters

While the new forms described in the paper have as usual an interest to the worker in this field, the synonymy of some of the older species is of even greater interest, backed up as the work is in most cases by the examination of types, and for that reason specific references in the following brief resume are limited to the status of some of the older species

Aglaothorax is a new genus created for *Tropizaspis* [illegible] [illegible]

[illegible] and by a lapsus calami *americanus* Saussure is used as [illegible] specific name instead of the older *haldemanii*. The author accords the same treatment to the three "species" usually known as *stevensonii*, *minutus* and *scudderi*.

The treatment of *Anabrus* is particularly interesting on account of the great difficulty workers have found in endeavoring to determine individuals of this genus. Uhler's *purpurascens* is considered a synonym of the typical *Anabrus simplex*, while *coloradus* Thomas is made one of three varieties of the type species. *Cacopteris* Scudder is shown to be a synonym of *Idiostatus* Pictet, while *Steiroxys bilineata* Thomas is transferred to the same genus, in addition to which Pictet's *Idiostatus californicus* is made a synonym of *hermanii* Thomas. *Platycleis fletcheri* new species, from Calgary, Assiniboia is remarkable as being the first New World representative of a hitherto Palæarctic genus.

The author of this revision of the American Decticinæ has given us a valuable and distinctly useful work and one for which the systematic Orthopterist is deeply indebted to him.—J. A. G. R.

DARWINISM TO-DAY. A DISCUSSION OF PRESENT-DAY SCIENTIFIC CRITICISM OF THE DARWINIAN SELECTION THEORIES, TOGETHER WITH A BRIEF ACCOUNT OF THE PRINCIPAL OTHER PROPOSED AUXILIARY AND ALTERNATIVE THEORIES OF SPECIES FORMING. —By Vernon L. Kellogg, Professor in Leland Stanford, Jr., University. New York; Henry Holt & Company.

In this work Professor Kellogg has given a very able and painstaking exposition of Darwinism past and present. The voluminous literature of the subject has been very thoroughly searched and the book is an excellent one for those that have neither the time or inclination to read through such a mass of detail for themselves. Valuable appendices giving the bibliography are at the end of chapters, and in many cases extracts from original sources. The work is primarily divided into two parts, Darwinism attacked and Darwinism defended.

INSECTS INJURIOUS TO VEGETABLES—By F. H. Chittenden, Sc.D., United States Department of Agriculture. Illustrated. Orange Judd Company, New York.

This publication will be useful for those who do not have access to the literature of the subject and also for those who have and lack the time necessary to find it. The author says there are 12,645 titles in American economic entomology and 72,000 references to noxious insects. Some of the illustrations are crude but are doubtless useful enough for the purpose intended.

A CATALOGUE OF THE HEMIPTEROUS FAMILY ALEYRODIDAE.—By G. W. Kirkaldy. And ALEYRODIDAE OF HAWAII AND FIJI, WITH DESCRIPTIONS OF NEW SPECIES.—By Jacob Kotinsky. Bull. No. 2, Division of Entomology. Board of Commissioners of Forestry, Territory of Hawaii.

This is a useful and valuable publication.

CATALOGUE OF THE NEUROPTEROID INSECTS (EXCEPT ODONATA) OF THE UNITED STATES.—By Nathan Banks. The American Entomological Society, Philadelphia.

Fifteen years have elapsed since the previous catalogue by Mr. Banks was published, and it is needless to say that the literature has been brought up to date. There are nearly 900 species listed.

A REVISION OF THE AMERICAN COMPONENTS OF THE TENEBRIONID SUBFAMILY TENTYRIINAE. By Thomas L. Casey. Proc. Wash. Acad. Sciences. Vol. ix, pp. 275-522.

Many new genera and species are described. The work has the appearance of having been carefully prepared and shows great research into a difficult family of the Coleoptera.

Doings of Societies.

Minutes of meeting of the Brooklyn Entomological Society, Brooklyn, N. Y., March 7th, 1907. Fifteen members present, President Dr. Zabriskie in the chair.

The paper of the evening was presented by Dr. John B. Smith on "Some Shade Tree Insect Problems," illustrated with lantern slides.

The introduction into this country of the Brown-tail Moth and the Gypsy Moth, and the spread of these insects in the State of Massachusetts, through the New England States, have introduced quite new and important modifications of the insect problem as applied to shade and forest trees. Both of these insects are much more destructive than any of our native species, and while the Gypsy Moth spreads slowly, it is an omnivorous feeder, attacking conifers as well as deciduous trees; eating foliage of all kinds and even grasses in case of need. Where this insect is introduced all kinds of trees would have to be treated, and there would be no way of avoiding it by means of exempt varieties.

The Brown-tail Moth spreads more rapidly, but its caterpillars do not feed on so great a variety of plants. They do not attack conifers, and do not even eat all deciduous foliage. They have, however, one objection, and that is, the hairs are extremely poisonous, and when the insects are ready to pupate they shed their hairs to make use of them in building their cocoons, and in this way the hairs fly about and are apt to come into contact with human beings. Where this happens, a nettling or poisoning is set up in most persons, which is sometimes very severe, and it is hard to get rid of it, especially where it affects the eyes. Property values have been very much reduced where these caterpillars occur, because people will not live in such places. The State of Massachusetts has spent millions of dollars in an attempt to control these insects, and is still fighting.

A history was given of the introduction of the species and the work that had been done in the past. At the present time, the United States Government is co-operating with the Massachusetts authorities in an effort to introduce European parasites and other natural enemies in the hopes that these might become domesticated and aid in keeping the introduced insects in check. The present line of distribution has been toward the northeast, because the prevailing winds during the summer on the New England coast are from the southwest. In consequence, while the insects have extended the full length of the United States coast line, from Boston northward, and even have reached the British possessions, they have not extended west further than Connecticut, and have not yet reached New York State. In New Hampshire an active campaign is under way against the insects, and that State has its forest to protect. Where the two species occur together, as they do in Massachusetts, a forest area would be doomed in a few years.

The caterpillars of the Brown-tail Moth hatch in late fall and hibernate as partly grown larvæ. They eat the last foliage, and the first foliage that comes out in the Spring. The Gypsy Moth hatches from the egg in May or June, and eats during the middle of the summer. By the time the caterpillars of this insect are gone, the Brown-tail Moths have laid eggs, and their young are almost ready to make a new start. In this way an infested area would be kept stripped for the entire season, and no tree will survive this more than two or three years. Conifers will stand one defoliation only.

The greatest danger of transporting the insect from one place to another comes from the trolley lines and from automobiles that run through every portion of the infested district and out of it into those that are yet uninfested.

GEO. P. ENGELHARDT, *Recording Secretary*

A meeting of the Feldman Collecting Social was held May 15, 1907, at the residence of Mr. H. W. Wenzel, No. 1523 S. 13th Street, Philadelphia. Mr. E. Daecke, President, in the chair; thirteen members were present.

The President congratulated the newly elected members, and urged them to do what they can to help the Social, by prompt attendance, and by introducing communications at the meeting.

The resignation of Mr. Wm. J. Fox was read and accepted with regrets of the Social.

Mr. Harbeck offered the following correction: *Chaet[illegible] macroptera* v. d. Wulp, reported in meeting of Social on Dec. 19, 1906, as having been taken at Germantown, Pa., on Ma[illegible] 21, '06, should have been Trenton, N. J., July 7, '06.

Dr. Castle exhibited some interesting Coleoptera taken a Angora, Pa., on May 13th of the present year.

Mr H W Wenzel reported the capture by Mr K[illegible] *[illegible] grisea* at Clementon, N J. Mr Wenzel com[illegible] these specimens with the specimens in the Horn colle[illegible] The species is not in our list, being an introduced species fr[illegible] Europe

Mr Wenzel exhibited an apparatus devised to be used [illegible] place of an umbrella, and for other uses in collecting Coleopt[illegible]

Mr Greene exhibited specimens of a parasitic Hym[illegible] [illegible] species bred from a *[illegible]* cocoon

Mr Laurent remarked that in working up his materi[illegible] [illegible] in Florida this spring he finds that there [illegible] [illegible] species in it than he had expected

Mr H W Wenzel read extracts from a paper by H C [illegible] [illegible] life history of *[illegible]*. The species [illegible] [illegible] a pest in Herbariums, collections of C[illegible] [illegible] red pepper

Mr. Daecke exhibited some books which he recently acquired from the library of Baron Osten Sacken. Especially noteworthy is "Osten Sacken's Life," being copy with notes by himself in his own handwriting; also original drawings of the Diptera figured in the Biologia Centrali-Americana. Mr. Daecke reported the capture of 18 specimens of *Zabrotes subnitens* Horn, on strawberry blossoms at Manumuskin, N. J., on May 5, 1907. FRANK HAIMBACH, *Secretary*.

A meeting of the Feldman Collecting Social was held June 19, 1907, at the residence of Mr. H. W. Wenzel, No. 1523 So. 13th Street, Philadelphia. President Daecke in the chair; eleven members were present.

Cards were read from Messrs. Wenzel, Jr., and Kaeber, dated from Raton, New Mexico.

Mr. H. W. Wenzel reported the capture by his son of *Soronia grisea* at Malaga, N. J., on June 1, 1907, and suggested that this species must have established itself in New Jersey.

Mr. Harbeck exhibited specimens of *Eristalis flavipes* and *Mallota posticata*, showing mimicry of the two species.

Mr. Green exhibited his collection of Coleoptera taken at Malaga, N. J., on June 1, 1907; among it are specimens of *Merinus laevis*, *Ips obtusus* and *Boros unicolor*.

Dr. Skinner described the country now being collected over by Messrs. Wenzel, Jr., and Kaeber; he also gave a brief sketch of the itinerary of his intended trip to Canada on a collecting tour with Dr. Fletcher.

Mr. Daecke exhibited a box of Homoptera.

Dr. Skinner reported the death on June 5th of Mr. Harry D. Merrick of Cleveland, Ohio, formerly of New Brighton, Penna.

Mr. Viereck spoke of a trip near Brown's Mills-in-the-Pines, N. J., where he had looked for southern forms of Hymenoptera, but did not find any. He reported the capture at the same place of *Andrena cressoni* and *flavoclypeata* visiting blackberry blossoms.

Mr. Daecke reported the capture of *Cicindela consentanea* at Brown's Mills, N. J., and said it was common there.

Mr. Wenzel proposed a field meeting at Malaga, N. J., on July 20th, which was agreed to.

FRANK HAIMBACH, *Secretary*

A meeting of the Feldman Collecting Social was held on September 18, 1907, at the residence of Mr. H. W. Wenzel, No. 1523 So. 13th Street, Philadelphia. Mr. E. Daecke, President, in the chair; thirteen members were present.

Mr. Viereck stated that from among thousands of larvae collected from an abandoned canal ditch in the Philadelphia Neck during the latter part of August and first week of September, two undoubted female *Culex sollicitans* were bred, the large majority of the bred material was *Culex pipiens*.

Mr. Hoyer reported the capture of eleven specimens of *Buprestis rufipes*, from July 21 to August 28, 1907, at Angora, Pa., flying on dead or dying beech.

Mr. Greene stated that he observed females of *Chloraltis conspersa* ovipositing on dead beach at Angora, Penna. The same speaker exhibited specimens of *Cicindela unipunctata* Fab., taken at Malaga, N. J., September 15, 1907; *Sandalus petrophya* Knoch, Castle Rock, Penna., August 25, 1907, *Leptura emarginata* Fab., Lehigh Gap, Penna., July 23, 1907, *Ips obtusus* Say, Lehigh Gap, Penna., July 23 to 25, 1907, all collected by Mr. C. T. Greene.

Mr. Laurent made some remarks regarding the Denton and Riker mounts for insects, pointing out that there is still room for improvement. The speaker said that in his opinion the present mounts are all right for exhibition purposes and for the use of scholars in our schools, but of no practical use in a large study collection, where thousands of specimens are to be considered.

Mr. Wenzel spoke upon his son's trip to Southern Arizona, and exhibited a large number of interesting species among which were series of *Amblychila baroni* and *Cicindela* [illegible]; of the latter, three forms were taken, green, brown and black, all with maculations. Series of three species of [illegible] *magnifica*, one of the most beautiful Cerambycids, were exhibited. The speaker said that among the smaller species the collection would prove very rich. Pictures taken by Mr. Wenzel on the trip showing the different localities in which the collecting was done were shown.

Mr. Daecke spoke of his trip to Boston, Mass., during the time of the meeting of the Zoological Congress and the Entomological Society of America, in the latter part of August. Mr. Daecke reported the capture on August 3, 1907, at Stone Harbor, N. J., of *Diachlorus ferrugatus.*

It was agreed that the Twentieth Anniversary of the Social be appropriately celebrated, and Saturday evening, December 28, 1907, was chosen as the time of the said meeting.

FRANK HAIMBACH, *Secretary.*

A meeting of the Brooklyn Entomological Society was held April 4, 1907. Dr. Zabriskie in the chair; fifteen members and one visitor present.

Messrs. Christian Olsen and Alolf Chudova, both of Brooklyn, were elected members.

Mr. R. P. Dow's address, "The Dignity of Nomenclature," was a plea that in naming insects the lofty ideals of the great Linnaeus should be lived up to. Linnaeus did not name any insect which already had a name. He searched the Hebrew scriptures, the writings of the great Greeks and Romans. For ages man was too busy to name creatures, except when useful for food, or clothing, or dangerous.

Linnaeus's first generalization was a noble insect—a noble name; an insignificant insect and a humble name. The Lepidoptera he resolved to recreate out of *Papilio*—the Greek emblem of the soul. *Papilio machaon* was the first butterfly named. All the *Papilio* represented to his poetic conception the warriors before Troy. In the Saturnidae he conceived the race of peaceful giants of the golden age—*Cecrops*, *Attacus*, *Prometheus* and others. The beautiful genus *Actias* is devoted to the goddesses of the moon in all aspects, thus we have *luna*, *selene*, *artemis*, *leto*, etc. In *Sphinx* he recalled the silent guardians of the ancient Nile.

The genus *Catocala*, more poetically *Parthenos*, sacred to Athene, was determined in 1805. *Nupta*, *promissa*, *relicta*, *vidua*, *sponsa* and many others were consistently named, all representing attributes of attendants in the Goddess's train. *Hesperia*—from the God Hesperus, God of the Setting Sun, hence the west, were beautifully named in America, *e.g.*, *metea*, *comet*, *trignois*, *pottawotamie*, *pocahontas* and many other Indian names. Prof. Smith pointed out that the adoption of these names met with great opposition at the time from the prosaic scientists of Europe. The Airhorses, *plexippus*, *archippus*, *disippus* and others were cited as extremely appropriate.

The indignity of naming beautiful *Papilio* after living explorers or entomologists met with condemnation.

GEO. P. ENGELHARDT, *Cor. Secretary*.

A meeting of the Brooklyn Entomological Society was held May 2, 1907. President Dr. Zabriskie in the chair; seventeen members and two visitors present.

A latter from Mr. W. W. Hoover, a former member, dated at Sudan Mission, Northern Nigeria, West Africa, was read. Mr. Hoover described his journey, his present surroundings and several insects which had come to his notice.

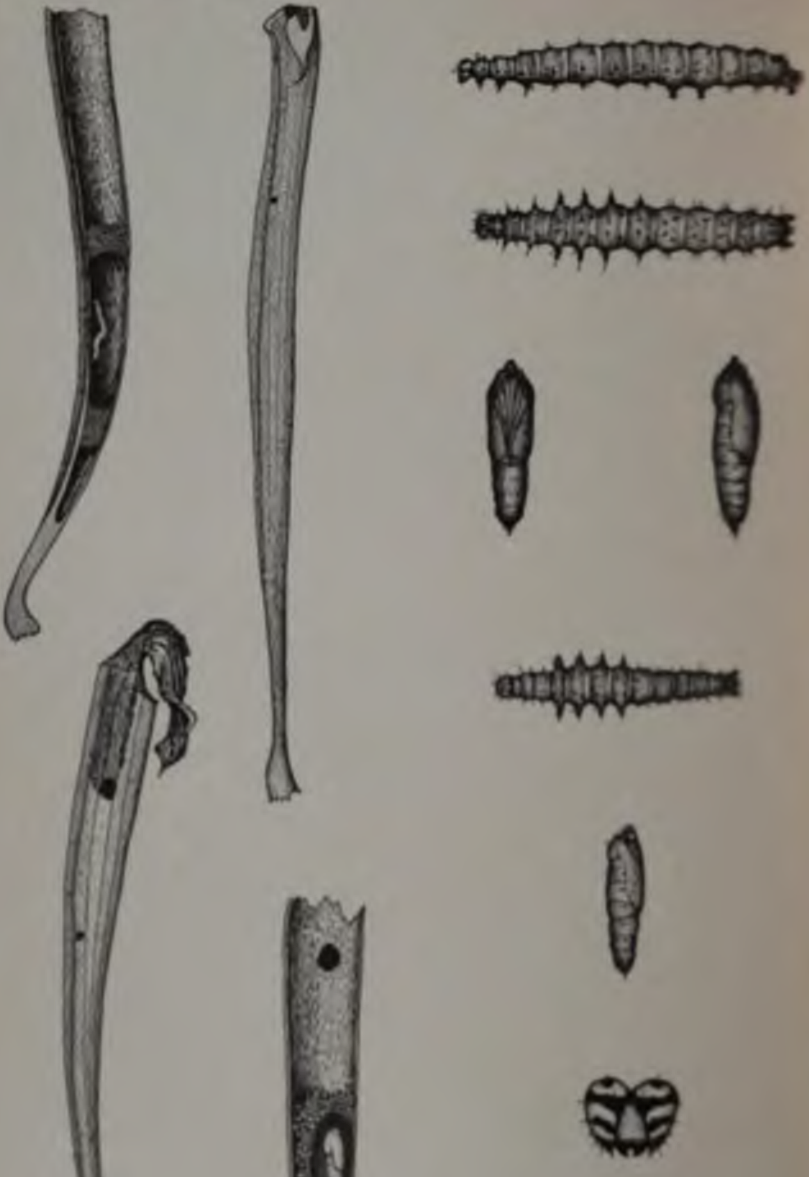
Mr. Schaefer exhibited one specimen each of *Leptura circumdata* and *Leptura proxima*, found in copulation by Mr. Shoemaker.

Mr. Engelhardt showed a photograph taken recently at Flatbush, Brooklyn, of a red oak tree, on which the *Amphibolips confluentus* grew in remarkably large numbers.

Mr. [illegible] stated that he had reared a number of [illegible] *[illegible]* and *[illegible]*. The moths though showing differences in maculation adhere closely to the mother [illegible] *[illegible]*.

Dr. Zabriskie addressed the Society on "Microscopical Examinations of External Structures of Hemipterous Insects" [illegible] the genera [illegible] *Sinea*, *[illegible]* and *[illegible]*. [illegible] explained the continuation of the same line [illegible] that presented on a former occasion referring to the [illegible] *[illegible]* and *[illegible]*. The address was illustrated [illegible] the lantern slides.

GEO. P. ENGELHARDT, *Cor. Secretary*.



PITCHER-PLANT INSECTS—JONES

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Pitcher-Plant Insects—II.

By FRANK MORTON JONES, Wilmington, Delaware.

(Plate XV, XVI.)

Exyra ridingsii Riley.

In ENTOMOLOGICAL NEWS for January, 1904, a paper with the above title gave the results of a few hours spent among the pitcher-plants of Richmond County, North Carolina, in August of the preceding year. In the territory then examined, *Sarracenia flava* "trumpets" and *Sarracenia purpurea,* our more familiar northern species, were almost equally abundant; *Exyra ridingsii* Riley and *E. rolandiana* Grt. were also present in numbers, and the larva of the former species was illustrated as found feeding in *flava.* Opportunity for a more extended stay among these most interesting plants came again this year; this time at Summerville, South Carolina, where *Sarracenia flava* is especially abundant, but where *Sarracenia purpurea* practically does not occur. Here *ridingsii* was found in numbers, but no *rolandiana,* which suggests that this latter species prefers—perhaps confines itself to—*purpurea,* its known food plant in the north. At Summerville another *Sarracenia, minor* Walt. (*variolaris* Michx.), replaces *purpurea,* and another *Exyra, semicrocea* Gn. replaces *rolandiana*. These two *Exyra, ridingsii* and *semicrocea*, differ remarkably in some of their habits.

Ridingsii passes the winter in the larval stage in a carefully constructed hibernaculum. These hibernating larvæ occupy sealed chambers low down in the dry stems of the leaves of *flava*, much more rarely in *minor*. This chamber is constructed in the dry corky frass which fills the lower portion of the leaf in which the larva has been feeding, is ceiled with an arched button of closely compressed particles lined beneath with silk, the leaf forming the walls and another accumulation of packed frass the floor. The space occupied by the larva (see Plate XV), is usually about an inch in length, but is sometimes much longer. This portion of the leaf, dry and dead in *flava*, green in *minor*, shows no trace of feeding, though the larvæ become active long before leaving their winter quarters. About April 15th, they leave these hibernacula, rupturing the ceiled roofs and creeping up through the loose frass above. After an interval of several days spent apparently without feeding, during which they may be found in the litter of dry and broken leaves of the preceding year, they creep up the tender new leaves, eat a round hole in the side, and immediately creep in. This occupies only about two minutes, and is the method of entrance without regard to whether the leaf chosen is a mature one, open at the top, or an unopened one. In the former case the larva ceils the open top with a transparent but strong silken web, and sometimes, but rather exceptionally, cuts a groove around the leaf internally, which eventually aids in bringing about the collapse of the upper portion of the leaf. This year, however, fully ninety five per cent of the larvæ chose immature, unopened leaves, the earlier leaves having been killed by the late frosts. In these closed leaves the larvæ invariably commence feeding at the top of the leaf, soon causing the hood and closed lips of the leaf to collapse (see Plate XX), thus effectually closing the tube and obviating the necessity for a ceiling web, which, however, [illegible] spun some distance down the tube. The notch cutting habit was not practiced in any of these immature leaves. As the larvæ spin a carpet of silk wherever they go, this also aids in keeping the tube effectually sealed and in preventing the opening of the growing leaf. These hibernating larvæ vary greatly in size, and moult at least once before the last larval stage is reached. After taking possession of a leaf, the lower portion of the leaf-tube rapidly fills up with corky frass particles, in which the cocoon is spun, the larva having previously cut two holes through the leaf wall,—a large one above for the emergence of the moth, and by burrowing down in the frass-filled tube, a small one some distance below the location chosen for the cocoon, this second hole being apparently for drainage; just above this drainage hole and between it and the cocoon, the tube is sealed with a lightly spun web, usually not too closely-spun to retain the water (see Plate XV). The small hole where the larva entered the leaf, unless obliterated by feeding or plugged with the accumulated frass, is usually closed with a web. The larva sometimes changes from the old leaf to a new one, and when this occurs just before pupation, unlike *semicrocea*, it eats enough of the new leaf to furnish frass and nibbled particles to render the cocoon opaque; usually, however, the cocoon is composed of the corky frass particles loosely held together with silk, and is built against one side of the tube, the leaf-wall on that side forming one wall of the cocoon. All the pupæ of a midsummer brood examined in Richmond County, N. C., in 1903, were pale amber color; of several hundred pupæ under observation at Summerville, S. C., this spring, nearly all were very dark, some even almost black. The same variation in color of pupæ was noted in *semicrocea*, so the dark pupæ may be characteristic of the spring broods.

The pupa of *ridingsii* is similar to that of *semicrocea*, illustrated by Riley, but the cone-shaped projection over the head is much larger in the former species (Plate XV, upper figures, *ridingsii*, lower figures *semicrocea*). In *ridingsii* the pupal stage lasts ten to twelve days, emergence taking place in the daytime, usually between twelve and four o'clock. The pupa sometimes forces itself through the top of the cocoon before the escape of the moth. Pupation of the spring brood takes place from May 8th, to May 20th, and the emergence of moths is about complete by June 1st. The moths are extremely variable, some examples being suffused with black to the obliteration of all markings on the wings.

The larva of *semicrocea* has been described and figured by Riley; that of *ridingsii* is very similar, but is slightly larger, measuring fully one inch in length, just before pupation. Its color varies in different examples from brown to a bright reddish-maroon, banded with white between the segments like *semicrocea;* the subdorsal fleshy processes, or lappet-like projections, of the first four abdominal segments are not as large proportionately as in *semicrocea,* and in *ridingsii,* are also present, though of smaller size, on the thoracic segments. *Ridingsii* is noticeably less pubescent than *semicrocea,* and the dark markings on the head, of similar pattern, are usually heavier. The upper figures on Plate XV illustrate the larva of *ridingsii;* the lower, that of *semicrocea.*

Ridingsii is peculiarly free from parasites. Of several hundred larvæ and pupæ, only two were observed to be parasitized, and these by a tachina fly determined by Prof. C. W. Johnson to be *Hypostena variabilis Coq.* The pupæ have an active enemy in a bird (?) which systematically selects the leaves showing the large emergence hole and splits them down until the cocoon is reached, abstracting the pupa. In one field, perhaps a quarter of the entire brood was so destroyed.

The dates given are probably a little later than those of an average year, as in 1907, throughout April and May the weather was unusually cool, with heavy frosts to the middle of April.

Exyra semicrocea Gn.

In the vicinity of Summerville, S. C., the dry grass, weeds and brush in the open pine woods and adjacent meadows where the pitcher plants grow, are burnt over each winter with the idea of improving the pasturage for the cattle, which are allowed to graze in the unfenced woods and fields. This results in the destruction of a very large proportion of the hibernating larvæ of *Exyra ridingsii,* and it is only in such spots as escape the annual burning that these caterpillars make their appearance in the spring. A full month before the appearance of the moths of this species, however, the moths of *Exyra semicrocea* Gn. suddenly appear in numbers in the leaves of the pitcher plants, both *flava* and *minor*. At this time (the middle of April), many of the *flava* leaves are well developed, but *minor* is much more backward and offers scant accommodation to the moths, which, for about two weeks, are very abundant, sometimes as many as four occupying a single leaf of *flava*. These moths evidently emerge from over-wintered pupæ, as the flower-buds and limited number of leaves available up to this time show no trace of larvæ feeding; unlike *ridingsii*, they are even more abundant in the burned-over tracts than in those sections which have escaped the flames, for in the burned portion the new leaves which give shelter to the moths are more numerous. A peculiar habit of the larvæ, it will be seen later, is probably responsible for their ability to survive the fires so destructive to *ridingsii*.

The moths of *semicrocea* and *ridingsii* are extremely averse to leaving their shelters; the leaves may be gathered and carried about almost indefinitely without disturbing them, and at any attempt to dislodge them, they back further down the tube of the leaf and are almost sure to be badly battered and rubbed in the process. This instinct to walk backward when alarmed (they always sit heads up in the leaf), is so persistent that when removed from the leaf and placed upon a flat surface, they are more apt to walk backward than forward.

The spring brood of moths has practically disappeared by May 5th. The pale yellow eggs, placed singly and several inches down from the mouth of the pitcher, were frequently noted in the larger leaves of *flava*, but subsequent observations indicated that practically all of their eggs, or the newly hatched larvæ from them, perished, and that the more suitable food plant of this species is *minor*, preferably the young and immature leaves not yet open at the top, though they also seemed to thrive, though less abundantly, in the tender, unopened leaves of *flava*.

The young larvæ have a very peculiar habit of feeding, which is evidently of great importance in insuring them safety from parasites and predaceous insects. They cut from one to three, or even four, encircling grooves around the inner surface of the leaf, well up in the swell of the hood, and extending as a tunnel out through the flat stiffening wing of the leaf. This groove is at first so small that it is invisible until the leaf is held to the light, and its effect varies with the age of the leaf. In a tender unopened leaf, in which larvæ are most frequently found, it quickly causes a shrivelling and drying of that portion of the leaf above the groove, so that while the lower portion remains tender and juicy, entirely suitable for the young larva to feed upon, the upper part ceases to grow, and soon forms a hard dry cap to the leaf-tube which is thus effectually closed to possible intruders. (Plate XVI, first figure, healthy leaf; second and third figures, leaves grooved by larvæ.) On older leaves, however, the groove seems to have little effect, and in these the larvæ feed until large enough to undertake the ceiling of the open top with a web of silk. This web is usually spun from the angle of the lips of the pitcher in front, curving upward into the arch of the hood, but the habit is varied, and the web is occasionally spun directly across the tube at the highest possible point, just below the lips, like *ridingsii* in *flava*, and in a few instances a double web, one from either side of the hood and meeting at the angle of the lips in front, was noted (see Plate XVI, three figures). The spinning of the web occupies only about three minutes. A single leaf usually carries the larva to the last or next to the last larval moult; on changing to a new leaf it spins the ceiling web in one of the three ways described and sometimes also cuts an encircling groove which is usually obliterated by feeding before it has any effect on the leaf. Feeding from the top downward, the lower portion of the tube becomes filled with frass, on approaching which the larva reverses its position and feeds upward, sometimes even forcing its way down in the frass-filled tube, that no available portion of the leaf may be left unconsumed.

The larva of *semicrocea* is readily distinguishable from that of *ridingsii* by the difference noted under that species.

A search for pupæ in the leaves showing the effects of larval feeding was entirely unsuccessful, and very few were found in the large number of winter leaves examined; it was not until a number of larvæ had been kept in captivity that the reason for this became apparent. In every case, these larvæ, when ready to spin, left the leaves in which they had been feeding and hurried about their cage for half an hour or more, before finding a place to their liking. This was usually a new and unfed-upon leaf, which they ceiled lightly with silk, well down in the tube, spinning a flimsy, almost transparent cocoon just below this web (Plate XVI, last figure). With this hint as to their habit, search in the field for pupæ was more successful. When a leaf containing no larva, but showing evidence of continued feeding, was found, the cocoon could frequently be located in an adjacent leaf showing no trace of feeding; but isolated plants showing undoubted evidence of having furnished food to one or more larvæ, often contained no cocoons in any of their leaves, indicating that the larvæ, in their wanderings, must frequently fail to find suitable leaves, and presumably spin their cocoon in the moss and stubble which surround the growing plants. The instinct to desert the leaf in which it has fed, and to spin its cocoon where no trace of feeding will give a clue to its presence, no doubt, in a measure protects this insect from the enemy so fatal to the pupæ of *ridingsii*, though many of the larger leaves of *minor* are split open, evidently by the same bird which reaps such a harvest in the *flava* leaves. This instinct also probably aids it to escape destruction by the fires so fatal to the larvæ of *ridingsii*, otherwise the abundance of *semicrocea* in tracts very thoroughly burned over, where no *ridingsii* larvæ survive, can scarcely be understood.

The first pupæ of the spring brood were noted May 19th, at which time many very young larvæ were still in the leaves. The pupal period varied from fifteen to eighteen days, but may have been extended by removal to a colder climate. The earliest emergence was recorded June 1st, and the latest from this brood, not until July 11th, so that undoubtedly the later broods overlap more or less with those of *ridingsii*. The pupa varies in color from pale amber to almost black. The moths are not so variable as those of *ridingsii*; the yellow area is seldom much clouded with dark scales, though varying considerably in extent, and the dark markings are usually well indicated, though showing considerable variation in intensity

C. V. Riley has figured this insect in all its stages (Can. Ent. VII, 207 and elsewhere). His account of the larval habits is evidently based on observation of a later brood in mature leaves; and the cocoon-spinning habit, as described by him, agrees more nearly with that of *ridingsii* than with *semicrocea*, as the two species were observed together at Summerville, S. C.

Thecla calanus and Thecla edwardsii.*

By Henry H. Lyman, M. A., Montreal.

In the first annual address, which, as President of the Entomological Society of Ontario, I had the honor of delivering in 1898, I ventured to say to the "lumpers" that "once a form has been described as a new species it should not be lumped, except upon overwhelming proof." To this doctrine the able editor of ENTOMOLOGICAL NEWS gave his adhesion in 1899,[1] but seems to have withdrawn from this position in his article on the above named species in ENTOMOLOGICAL NEWS of February, as his "proof" of the identity of these forms is anything but overwhelming.

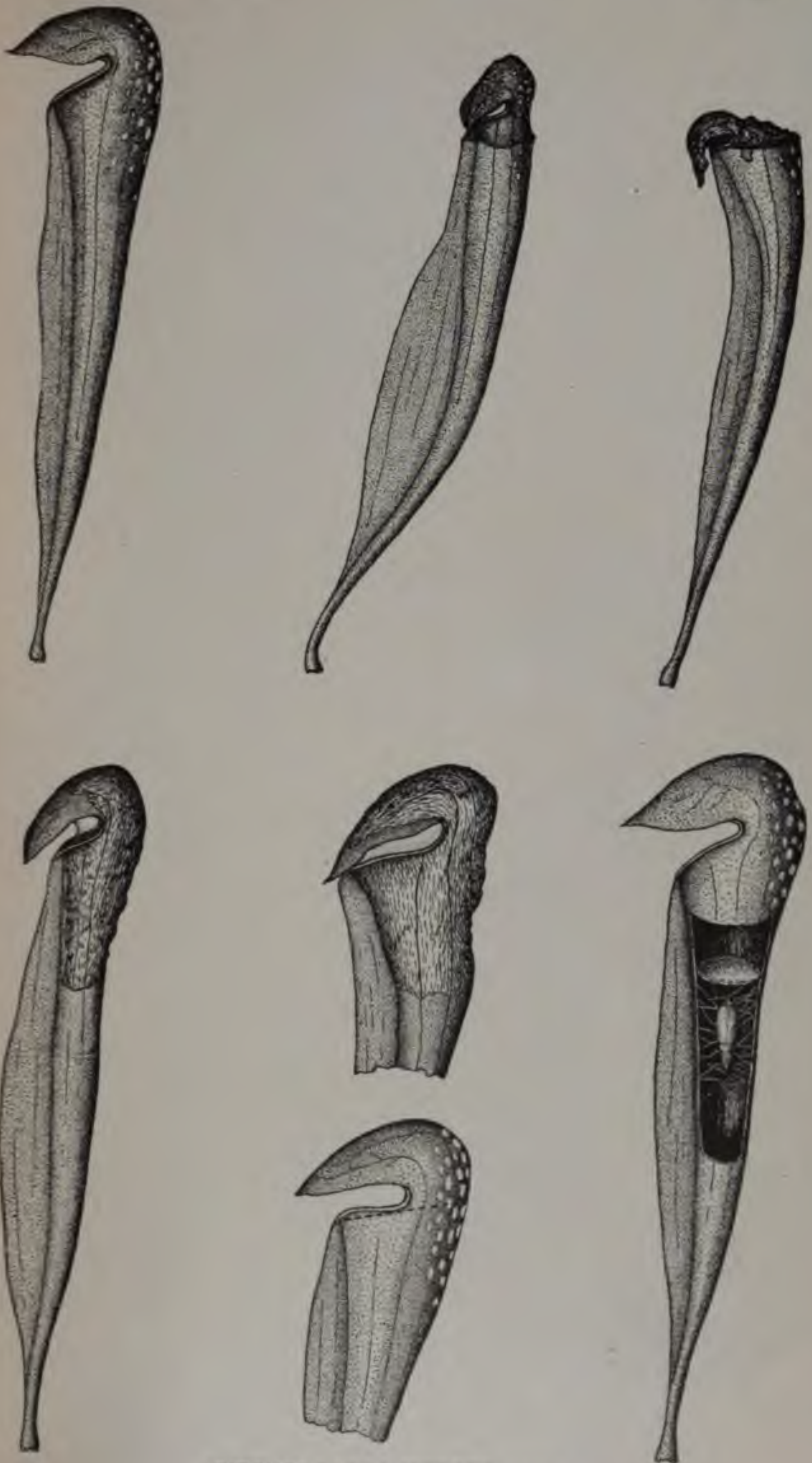
These unfortunate little butterflies have been more hardly treated by the authorities than any other of their genus in this continent, as anyone may see by a very slight examination of the literature of the subject

Dr. Skinner changes the spelling of the second name to *edwardsi* and though I am not one of those who would cling to an original spelling where obviously wrong, I think that the original form, when not wrong, should be adhered to.

This species has universally been credited to Dr. Saunders, which seems rather strange as no description was ever published by him, and on the appearance of the description in [illegible]

* [illegible]

[1] Can. Ent. [illegible]



PITCHER-PLANT INSECTS—JONES

Grote and Robinson of *Thecla lorata,* and their supposed identification of *edwardsii* with *Thecla calanus,* Westwood,[*] he withdrew his proposed name, and said that *calanus,* West., must be substituted.[†]

But the man who did the most to unravel the tangle in connection with these species, although at first he had confused them, not only with each other, but even with *Thecla acadica,* was Dr. Scudder, who illustrated them beautifully in his sumptuous work on the Butterflies of New England, and gave the fullest references to the literature, and it was he who suggested the retention of the name originally proposed in correspondence by Dr. Saunders.[‡]

Dr. Saunders' original description was read before the London Branch of the Entomological Society of Ontario, and was possibly communicated to both Mr. W. H. Edwards and Dr. Scudder, but as it was never published it cannot be referred to, but there can be little doubt as to the correctness of its reference by Dr. Scudder to the form with which it has ever since been associated, although Dr. Saunders himself identified it with *T. calanus,* West.

Why *calanus* was credited to Westwood by Grote and Robinson, I fail to understand, unless it may have been on the supposition that he was the author of the generic combination, which vicious practice Grote formerly followed, but if so, they must have overlooked the use of the name in Doubleday's List of the Lepidoptera of the British Museum, which I have not had access to. The reference to Westwood was probably based on its mention in the list of Theclas in the second volume of the Genera of Diurnal Lepidoptera popularly credited to Doubleday, Hewitson & Westwood, of which the first volume was by Doubleday; the second by Westwood, and the plates only by Hewitson, but in that work it is correctly credited to Hübner.

In looking up the references, I have discovered several curious errors.

The original reference is to Hübner's Samm. Ex. Schmett., but most authors merely specify Vol I; none give the number of the plate, probably because in the original edition the plates were not numbered, but in Wytsman's re-publication they are, and this plate is No. 100. No description was given by Hübner, but his figures are unmistakable as to the underside.

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[*] Trans. Amer. Ent. Soc., i, 171-173.

[†] Can. Ent., i, 99.

Proc. Bost. Soc. Nat. Hist., xiii, 274.

At the time Messrs. Grote and Robinson described their *Thecla lorata* and *Thecla inorata*, they were of the opinion that the species, since known as *edwardsii* Saund., was the same as *calanus*, Hübn., and stated* that they had seen Godart's type of *T. falacer* in Dr. Boisduval's collection, and that it was a specimen of *calanus*. If they were correct in their identification, and if the specimen they saw was really the type of *falacer*, it would mean, as pointed out by Mr. Grote,† that the name *T. falacer*, Godt. would have to replace *T. edwardsii*, Saund., but from the descriptions given by Godart,‡ which I here transcribe, I am inclined to think that the species described was the true *calanus* as we know it:

"No. 58 Polyommate Falacer.

"Ailes d'un brun-noiratre: leur dessous avec deux traits discoïdaux et deux lignes postérieures ondulées d'un bleu-pale; celui des inferieures ayant à l'angle interne trois lunules rousses."

Further on in the work (page 633), there is the following fuller description:

"No. 58 Polyommate Falacer

"*Pol. alis fuscis, subtùs lineola gemina disci strigisque duabus apice undulatis cærulescentibus; posticis lunulis tribus anguli ani rufis.*

"Il a un peu plus d'un pouce d'envergure. Le dessus des ailes est d'un brun noiratre sans tache dans la femelle, avec une tache blanchatre cotonneuse vers le milieu des ailes superieures du male. Le dessous est a peu pres de la couleur du dessus, avec un double trait central, puis deux lignes transverse et ondulees, d'un bleu pale et bordees de brun fonce sur un de leur cotes. Les secondes ailes ont en outre pres de l'angle de l'anus trois chevrons roux, dont l'interieur separe des deux autres par un large groupe d'atomes bleuatres. Des environs de Philadelphia, Amerique Septentrionale."

If, however, Godart's type can be certainly identified it should be possible to settle the point beyond doubt.

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* Trans. Amer. Ent. Soc., i, 344.

† Can. Ent., [illegible]

‡ Godt. Encycl. Meth., ix, 633.

The plate, No. 29, illustrating *Thecla falacer*, in Boisduval and Leconte's work, is quite correctly referred to as representing *T. calanus*, Hübn., but I do not see that it has been by any means satisfactorily established by Mr. Grote, as stated by Dr. Saunders * that the description in the text was drawn up from *T. edwardsii*.

In Proc. Bost. Soc. Nat. Hist. XIII, 272-276 (1870), Dr. Scudder published an exhaustive paper on the synonymy of *Thecla calanus*, correcting the misidentifications of Grote and Robinson, but ignoring the form *lorata* which has been recognized by other authors as a variety of *calanus*. This reference of *falacer*, Godt., as a synonym of *calanus*, Hübn., may be, as above shown, open to question, but his statement that all the specimens in the Harris collection are *edwardsii* is not quite correct, if that collection is in the same condition now as when he examined it. I recently had an opportunity of examining it, and found that there were three specimens of *edwardsii* ♀ all bearing a printed number 76, and with manuscript numbers 160, 405, 405, which referred to Harris' list of specimens in which they were entered as *falacer*.

There was, however, in addition, one specimen of *calanus* ♂ which bore a printed number 75, but no manuscript number, but there was a label put on in error by some one, which bears the words, "Notodonta, July 20 45." It may, however, be safely accepted that *edwardsii* was the species which Harris called *falacer*, although in his description, † he says that the rows of spots on the under side are bordered on one side only with white.

In his references, he duplicates those to the papers by G. & R., giving the names of the papers and the page numbers of the author's separates, as well as the pages in the Trans. Amer. Ent. Soc.

Grote disagreed with Scudder's conclusions, and wrote a paper from Demopolis, Ala., which was published in Can. Ent. II, 165-168, in which he claimed that what Scudder called *edwardsii* was really *falacer*, Godt., and that *calanus*, Hübn.

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* Can. Ent., i, 99.

† Insects Mass., 276.

was probably the same, or possibly a mixture of both forms. and that, therefore, *T. inorata*, G. & R., was correctly described. He, however, made several errors in his references, giving the reference to his author's separate instead of to the "Transactions" for *T. inorata*, and giving on the last line of that species a reference to the "Transactions" where *T. lorata* was described, and in which there was no reference to *T. inorata*. In connection with this paper a very curious error was afterwards made by him, as in Can. Ent. XIX, 179, he refers to the above paper as "printed at Demopolis, Ala.," and "now out of print, but is in several libraries, and was generally distributed." Evidently he had before him an author's separate, and had quite forgotten that it was only written from Demopolis and printed in the Canadian Entomologist.

Scudder's reference under *calanus*, to Fernald's Butterflies of Maine, is erroneous as to pages, which should be 78-79 instead of 80-81.

Evidently these distinguished authors did not sufficiently heed the advice of the late Dr. Martin John Routh, the learned president of Magdalene College, Oxford, "Always verify your quotations." So much for the literature of the subject; let us now turn to the butterflies themselves.

Dr. Skinner began by separating his specimens by color and then concluded that they all belonged to one species.

On that method of procedure, no other result could be expected, for while it is quite true that in perfectly fresh specimens *calanus* is darker than *edwardsii*, this difference is soon lost in flight, and I have a specimen of true *calanus* which is lighter than any specimen of *edwardsii* in my collection.

What might be called the key to these species is found in the extra mesial band of the under surface, in *calanus* the spots forming a band, as indicated by Scudder's English name "The banded hair streak," while in *edwardsii* they are distinct though by no means equally so in all specimens. As butterflies are not stamped by a die like coins, they necessarily vary and in two such closely allied species as these we must naturally expect to find some of the variations running very close to each other, but I have never found a specimen which I could not place.

There are other differences mentioned by Scudder. In *calanus* the discal stigma of the male is oval, nearly twice as long as broad, while in *edwardsii* it is narrow and three times as long as broad. According to Scudder's illustrations, the scales of the discal stigmas differ slightly in form, those of *calanus* being slightly broader in form and differently shaped at the base, where they are rounded, while in *edwardsii* they are angulated at the base and the sides straighter and less tapering. According to Scudder's figures, the abdominal appendages of the males also differ distinctly, but I have never made a study of these parts. There is one point, however, which I consider of very great importance, and that is, the occurrence of *calanus* where *edwardsii* is not found. Were they merely forms of one species, they should fly together, and while they, no doubt, do in some localities, in others they do not. In Montreal *calanus* occurs in fair abundance on the blossoms of the common milkweed (*Asclepias cornuti,* Decaisne), being, in fact, the only *Thecla* we have which is at all common, but *edwardsii* has never been taken at Montreal, so far as I am aware, while I have taken it abundantly in High Park, Toronto, on the blossoms of New Jersey tea (*Ceanothus americanus,* L.).

I have never bred *edwardsii,* but found a larva of *calanus* on the red oak (*Quercus rubra,* L.), and reared it to the imago.

Until, therefore, far more weighty arguments are brought forward than any of those adduced by Dr. Skinner, I shall hold these forms separate in my collection as distinct species.

◆

Rare Hemiptera in Virginia.—During the past season I have taken several rare species near Falls Church. *Isometopus*, which I had not seen for four or five years, was found in two localities on the bark of black oak trees July 27, August 2. It was the unmarked species; both of our species of this genus are undescribed. *Heidemannia cixiiformis*, which belongs to the same family as *Isometopus* I found once on a small black oak tree July 20. While looking on tulip trees for Psocidae I found adults and cast nymphal skins of a *Tingis*, *T. uniformis*. It was in the early part of August, and none were found on other trees. On the foliage of tulip trees I found an interesting capsid—*Eucerocoris guttulatus*—quite abundantly in August. They are difficult to recognize at rest, and when disturbed are very active and difficult of capture.—N. Banks.

Insect Bionomics.

BY VERNON L. KELLOGG.

(A paper read before the section of Entomology at the Seventh International Zoological Congress, Boston, August 19-23, 1907.)

Insect bionomics is a title that may not meet with the approval of some. They would say insect ethology, or ecology, or biology, or natural history. But whichever of these titles we use, we all recognize, under the name, a common point of view and common subject of study. The particular point of view is that of the inquirer after the relation of insects to other organisms and to their physical environment, and of the inquirer after the laws that govern the variation, inheritance, distribution, adaptation, and species-forming of insects. The student of insect bionomics is the student of evolution, using insects as study material. The study of insects, less for the sake of a knowledge of insects than for a knowledge of the laws of life, is the interest and endeavor of a growing number of entomologists.

A European zoologist, to whom I was introduced in Naples, said, with kindly condescension, "Ah, yes, I know, an American entomologist who knows something of biology." The intended kindliness of this remark was all that prevented me from expressing my own hopelessness of meeting a general biologist who troubled himself to know much about insects. A constantly growing acquaintanceship with American and European zoologists keeps me continually surprised at the extraordinary lack of appreciation of the possibilities and advantages of a serious attention to insects on the part of general biologists and students of evolution. But also I must add that my acquaintanceship with professed entomologists compels me to recognize that we ourselves need rousing to the great opportunity in our hands of forwarding scientific knowledge touching the focal biologic problem; namely, the problem of the origin and method of species-change and evolutionary descent.

In the study of insect biology we have to do with an enormous number of related animal kinds very consistent in their essential animal structure and physiology, but extremely plastic as regards superficial modification and adaptation, these kinds occurring in closely massed great series of individuals, easily observed in nature, readily obtainable as laboratory and museum material, conveniently and economically reared and experimented with, well known systematically and morphologically, and so abundant, widespread and adaptive that they have carried to an extreme almost all types of ecologic shifts for a living. They truly offer themselves as the most accessible of all animal material that the student of evolution problems can work with, and yet they compose that animal group relatively, if not absolutely, least taken advantage of for this purpose.

The number of known insect kinds is, roughly, about 350,000; more by far than the total of all kinds in all the other animal classes taken together. This very weight of existent species, coupled as it is with an equally extraordinary high numerical representation of individuals brings about a life pressure which has resulted in the high development of a great variety of adaptation; adaptation in food-getting, in means of defense and offense, in egg-laying and care of young, in nest-building, in a score of other phases of specialized life. This adaptation or modification, both structural and functional, in its turn leads swiftly and variously to species-change—that is, to species-forming. And adaptation and species-forming are the two fundamental and co-equal problems of evolution today.

But there are various outworks of the grand problems to be attacked, one or a few at a time. There are various avenues or lines of approach to the problems. Such lines or phases of the general study of evolution are denoted under the various titles of variation, heredity, isolation and distribution, parasitism, commensalism and symbiosis, color and pattern, regulation and regeneration, and others.

It is my wish to refer simply, and almost in cataloging manner, in the few minutes at my disposal, to some of the contributions already made from insect biology to the study of these evolution problems, and to point out further work and opportunity that lies ready to our hands.

In variation studies the opportunity afforded by the insects is extraordinarily favorable. The precisely determinable character of differences in color, in pattern, in venation details, in numbers of spurs, spines and hooks, in linear dimensions, etc., coupled with the ease of collecting long series of individuals bred in identical or determinably different conditions of climate, locality, season, altitude, etc., make insects very available material for studies in variability. Such intensive studies as those of Miss Enteman on *Polistes* and Tower on *Leptinotarsa* well illustrate the possibilities and the value of insects to students of variation.

In experimental studies in heredity the availability of insects as *Versuchs-object* is marked. The rapidity and the prolificness of reproduction enable a student to get data from hosts of individuals in a single year. Miss McCracken gets six and seven generations of *Lina* and *Gastroidea* each season in her elaborate investigation of the behavior of inheritance in these dichromatic and sporting species. She breeds and examines carefully and obtains quantitative data from 50,000 pedigreed individuals a year as a basis for generalizations. Compare this with the laboriously and expensively derived data from the birds and mammals so commonly used in experimental studies in heredity. Using silkworms, representing a dozen races, most of them well distinguished and stable, I have been able to get inheritance data representing from ten to thirty thousand individuals a year.

In the field of distribution and isolation studies, much may be done now and much more as our faunistic knowledge of insects increases. But intensive studies, like Shelford's with the tiger beetles, show how pertinent are the data to be derived from such studies.

It is, of course, familiar knowledge that the development of the various theories connected with the relation of color and pattern to surroundings, viz., the theories of protective and aggressive resemblance, of warning colors, of directive coloration, of alluring and recognition marks, and of mimicry, has been almost wholly based on studies of insects. Bates, Fritz Müller, Poulton and Marshall have built up their interesting theories almost wholly from conditions found in the insect world. Particularly needed in this field is experimental work such as that so admirably exemplified by Marshall in South Africa.

In the fascinating field of the parasitic, commensal and communal relations of animals it is again familiar to us all how dominant are the results derived from the studies of insect life. The splendid work of Wheeler alone is revelation and inspiration enough to make every entomologist an ardent student of this phase of animal bionomics.

Nor do the insects fail to offer themselves as inviting material for such phases of study as regeneration, regulation, etc., more familiarly associated with animals less completely organized. Oudemans, Verson, Brindley and others have contributed valuable data to the knowledge of regenerative and regulatory processes from their work on *Bombyx, Porthetria,* Blattidæ, etc.

In studies of the generative phases of life, insects have contributed profitable data, and can be made to give much more. The classic observations of Siebold on natural parthenogenesis in the aphids and the pioneer work of Tichomiroff on the artificial parthenogenesis of silkworm eggs are examples.

In the now immensely worked realm of animal behavior and psychology the insects can be sought to great value. Highly organized and specialized as they are, clever work can still manage to analyze much of the complexness of their behavior into simple terms. Loeb's epoch-making paper on heliotropism among animals was based largely on experiments with caterpillars.

I might go on, only to become tiresome, and refer to other achievements and opportunities of special students of insects. The whole point is this: The insects are unusually available and valuable material for evolution studies; they are not being used nearly as much as they ought for such studies, although when so used they have presented most valuable data. Therefore, it should be our duty as entomologists both to encourage general biologists to give more attention to insects, and to give ourselves more attention to the general biology phase of insect study.

On the Phorid Genera Plastophora and Pseudacteon.

By Charles T. Brues.

In a recent paper published in the Canadian Entomologist* Mr. D. W. Coquillett describes a remarkable new species of Phoridae parasitic on ants. He has erected a new genus for its reception, naming the species *Pseudacteon crawfordii*. It was discovered in Texas ovipositing on the heads of the ant, *Solenopsis geminata*, after the manner of the related *Apocephalus pergandei* Coq., which is a parasite of various species of *Camponotus* in this country.

In examining Mr. Coquillett's description and figures I was struck by the similarity between *Pseudacteon* and the genus *Plastophora* Brues,† and have recently obtained through the kindness of W. D. Pierce two paratypes of *Pseudacteon* for comparison.

I find that the two genera are extremely similar and not separable by any characters which I consider to be of generic value. The only differences which I have been able to detect are the more slender legs, less prominent mouthparts, and larger pyriform antennae of *Pseudacteon*. Differences of the same magnitude occur in other genera, for instance in *Aphiochaeta* and *Hypocera* where they cannot be utilized for generic separation on account of the species which occur with intermediate characters. In the Genera Insectorum (Fascicle 44. Fam. Phoridae, p. 11, 1906) I have placed Verrall's *Phora formicarum* in *Plastophora* with some doubt, but now feel assured that it properly belongs here as it seems more closely related to *P crawfordii* than to the type of the genus. The genus therefore should now contain the following three species:

P. beirne Brues, Ann. Mus. Nat. Hung. iii, p. 551 (1905). New Guinea (type of genus).

P. formicarum Verrall, Journ. Linn. Soc. Zool. xiii, p. 258 (1877) England.

P. crawfordii Coq., Can. Ent. xxxix, p. 208 (1907). Texas.

This note is presented at the present time in order that the change may be incorporated in the generic tables of Phoridae for Professor Williston's forthcoming manual.

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* June 1907 p. 207. A New Phorid Genus with Horny Ovipositor

† Ann. Mus. Nat. Hung. III, p. 551 (1905).

An undescribed Dimorph of the Box Elder Aphid Chaitophorus negundinis.

By L. C. Bragg, Colorado Agricultural College.

(Plate XVII.)

The alate and apterous forms of the above Aphid were described by Professor Cyrus Thomas, in 1878, in Illinois.

On June 19th, 1905, the writer found the dimorph in Fort Collins, Colorado, on the upper veins of the leaves of the box elder, *Rolac negundo.* This form was so exceptional with the twenty-two leaf-like flabellæ arranged on the margin of the abdomen that the resemblance to the European species, *Ch. accris,* which has fourteen, was very striking.

This form was kept under observation during the summer, and the facts demonstrated that it does not moult and does not reproduce. Many empty skins were found where the aphid had been sucked dry by some predacious insect, but none showed the characteristic split on the back that one finds in all moulted skins.

In 1906, I began early to look for the dimorph, but did not find it until June 4th. They did not become plentiful until the middle of the month, and I could not determine whether they were the progeny of the alate or of the apterous form. On June 16th, I began dissecting the mature insects, and soon learned that both the apterous and alate forms gave birth to the dimorph. Not only this, the dimorph was associated with the normal young in the same mother in several instances. Of one hundred specimens dissected, there were nineteen alate females and eighty one apterous females. Of the nineteen alate specimens, fourteen had dimorphic embryos only, while five had the normal forms only. Of the eighty-one apterous females, thirty-nine contained dimorphic embryos, and forty the normal form. These results would indicate that the dimorphic form is produced in as great numbers as the normal form in this generation. The leaves of the host plant would also indicate this, for they sometimes crowd each other on the veining of the upper side of the leaf. The normal form sucks the under side of the leaf and the tender stems. It would seem that the dimorph, from its diminutive size, is unharmed, as parasites and predacious insects rarely trouble it, and for weeks it remains on the leaf where it first settled. It taps the vascular system of the plant where its food is most abundant. Abundance of food, however, does not tend to enlarge this form, for it is never larger than when a few minutes old.

Last fall the apterous sexual forms were kept under observation, and by marking trees where the oviparous females had deposited eggs, I felt quite sure that the following spring I should be able to take the stem mothers when the eggs hatched. I took branches containing eggs into the laboratory of the Agricultural College as soon as the buds began to swell, but these did not hatch, and Professor Gilette was fortunate enough to find young on the trees on February 23d. Some of these may have been hatched for a week or more. On March 10th, these stem mothers began reproducing. One of these was separated on the 13th, and on the 25th had given birth to one hundred and seventeen young. I accidentally killed her at this time, so cannot say how many she might have produced. Another died after producing one hundred and fifty-four. All of the first two generations are apterous. The third generation produces both alate and apterous forms. The dimorph does not appear until the fourth generation.

Why this form should appear in the fourth generation, [illegible] in any other, is a mystery. I know of no other animal [illegible] gives birth to young that are apparently useless to the species. It would seem to be a case of the survival of the unfit, as [illegible] neither reproduces nor aids the species in any way.

The cuts have been made from drawings by the staff artist, Miss M. A. Palmer. Fig. I represents an apterous [illegible] of second generation. Fig. II, an alate female of the third generation. Fig. III, dimorph which is of the fourth generation.

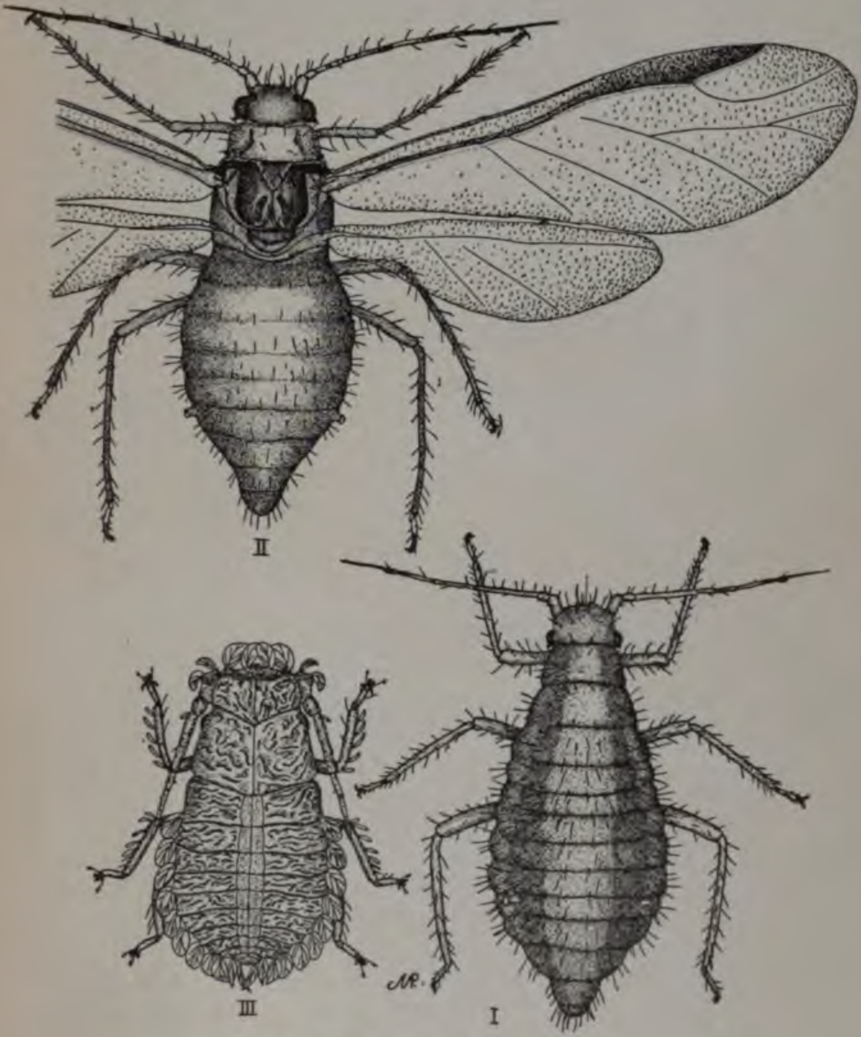
[illegible] Plate XVIII.)

[illegible] I. Apterous female belonging to second [illegible]

[illegible] II. A[illegible] belonging to third generation.

[illegible] III. Dimorph belonging to fourth generation. [illegible]

[illegible] Miss M. A. Palmer, artist.)



CHAITOPHORUS NEGUNDINIS—BRAGG.

On some Heteropterous Hemiptera from N. Carolina.

By J. R. de la Torre Bueno and C. S. Brimley.

This preliminary list of Heteroptera is based on collections made by C. S. Brimley, principally in the vicinity of Raleigh, with an occasional trip to Lake Ellis in Craven County, where the very interesting Naucorid noted later on appears to be abundant.

The classification employed is that of Schiodte* as modified by Kirkaldy,† which may be regarded as the best expression of the relationship of the families thus far propounded.

The only synonymies given are such as serve to bring out the difference between this and the older classification.

It will be noted that certain of the families are not represented, while others not heretofore recorded from the United States make their appearance.

All the biological data are by the junior author.

Division A.—PAGIOPODA Schiodte.

Family CLINOCORIDÆ Kirkaldy (= CIMICIDÆ Leth. and Serv.)

Genus **CLINOCORIS** Fallén (= *Cimex* Auctt. =*Acanthia* Auctt.).

C. lectularius Linne. Not uncommon, although not represented in the collections.

Family OCHTERIDAE Kirkaldy (=PELOGONIDAE Auctt.).

Genus **OCHTERUS** Latreille (= *Pelogonus* Auctt.).

O. americanus Uhler. Raleigh, N. C., March 25, 1905. One specimen found under a stone near the edge of a stream.

Family NERTHRIDAE Kirkaldy (=GALGULIDAE Auctt. = GELASTOCORIDAE Kirkaldy).

Subfam. GELASTOCORINAE Kirkaldy (= GALGULINAE Auctt.).

Genus **GELASTOCORIS** Kirkaldy (= *Galgulus* Auctt.).

G. oculatus Fabr. Raleigh, April 7, 1904, March 21, 24 and 25, 1905, March 31, 1906, April 7, 13, 1906, May 29, 1906, June 11, 12, 1906, July 17, 1903, August 23, 1903, August 8, 1906, October 5, 1906, October 16, 1905.

Apparently the commonest form near Raleigh. The specimens before us are very well marked and cannot be mistaken for any other species. In connection with this it may not be amiss to state that the commonly accepted statement that this is the only form to be found in the United States is erroneous. The senior author has in his collection at least five species from the Atlantic seaboard, and two or three more from the Pacific coast, all but one of which are undescribed.

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* Ann. and Mag. N. H., ser. 4, vol. vi, Sept., 1870.

† Trans. Am Ent. Soc., xxxii, No. 2, 1906.

G. sp. Lake Ellis, May 8 18, 1906. Some two or three taken.

This is a form very distinct from *oculatus* Fab., approaching the Central American species. It differs from the common *oculatus* in size, shape, markings, although it must be said that color in the genus is absolutely negligible. This form also occurs in New Jersey.

Family NAUCORIDAE Stal.

Subfamily NAUCORINAE Kirkaldy.

Genus **PELOCORIS** Stal.

P. carolinensis Bueno. Lake Ellis, June 8 14, 1905, May 18, 1906. Abundant.

This interesting little form is very distinct from our common *P. femoratus* Pal. de Beauv., and approaches near the smaller and more slender tropical American species.

Family BELOSTOMATIDAE Auctt.

Genus **BENACUS** Stal.

B. griseus Say. Raleigh, March, 1903, at electric light; also taken in 1905, March 10 [illegible] 23, May 6 [illegible] 16; in 1901, September 20 [illegible]; November 18 [illegible]; in 1902, April 1 [illegible]; in 1903, March 1 [illegible] 11 [illegible] 12 [illegible] 20; in 1904, March [illegible]; in 1905, January [illegible], June 21 [illegible]; in 1906, April 11 [illegible] 18 [illegible] 12 [illegible]. The spring flight in March or April seems the [illegible] though there are several others during the year.

Genus **AMORGIUS** Stal. *Belostoma* Auctt. nec Latreille.

Subgenus **Montandonista** Kirkaldy.

B. [illegible] Montandon. Raleigh, July 3, 1904, at electric light; also taken March [illegible], and in 1906, April 13 [illegible], June 18 [illegible] 21 [illegible].

Not uncommon at times in summer around electric lights, [illegible] abundant as *B. griseus*, nor does it fly so early in the season.

Genus **BELOSTOMA** Latreille (= *Zaitha* Auctt.).

B. aurantiacum Leidy (=*lutaria* Stal). Raleigh, April, 1900; May 25, 1905.

This species appears to take the place in the southern States of our common northern *B. fluminеum* Say.

B. flumineum Say. Raleigh, April 16, 1906.

One specimen only of this species which appears to be only of rare occurrence around Raleigh. Another specimen was taken in the spring of 1905.

B. testaceum Leidy (=*Zaitha reticulatum* Haldeman). Raleigh, April' 1900; in 1906, April 12, June 11 (1), August 8, (4), 9 (2).

A far from uncommon species which also occurs sparingly in the north.

Family CORIXIDAE.

A number of species in the genus *Corixa* have been taken from time to time, but in the present chaotic condition of the American species of the genus it has been thought best not to attempt to list them.

Family NOTONECTIDAE Leach.

Subfamily NOTONECTINAE Kirkaldy.

Genus **NOTONECTA** Linné.

N. undulata Say. Raleigh; November 9, 24, 1904.

The usual forms in this species, which is not at all common. This species has been taken only in the pool in Green's rock quarry where it is usually abundant, except on November 23, 1905, when some were taken in a pool in Walnut Creek lowgrounds. Mr. Sherman also took it at Warsaw, Duplin Co., North Carolina, May 19, 1905.

N. irrorata Uhler. Raleigh, 1905, March 21, 29, October 16, November 13, April 7, June 11, 4 newly transformed specimens, August 8. Taken by Mr. Sherman at Warsaw, May 19, 1905.

N. variabilis Fieber. Lake Ellis, May 14, 1906.

Three specimens which are placed here provisionally. They are slimmer than the usual run, but in the absence of a minute scrutiny no good characters have been found.

N. raleighi Bueno. Raleigh, October 17, November 25, 1904; in 1905, March 9, 17, April 15, August 5, October 16, November 23 and February 26, 1906.

This very interesting little species is represented by good series. It is easily separated from *N. variablis*, its nearest relative, by the smaller size, blackish fasciae and notocephalic structure. Apparently more widely and uniformly distributed than any other species found here.

N. uhleri Kirkaldy. Raleigh, March 1, 9, 25, 29, 30, April 15, October 16, 1905, and April 22, 1906.

This rare form has been taken on several occasions, about 20 having been taken altogether. More widely distributed in this neighborhood than any other species, except *raleighi*, with which it is usually associated.

Genus **BUENOA** Kirkaldy (**Anisops** Auctt., partim).

B. albida (?) Champion. Raleigh, October 27, November 9, 24, 1904, October 16, 1905, and August 8, 1906.

This species is very common and is the form commonly listed as *platycnemis* Fieber, although it does not at all agree with the original description. Although it is tentatively identified as Champion's species, it may after study prove to be undescribed.

Division B.—TROCHALOPODA Schiødte.

Family REDUVIIDAE

Genus **PYGOLAMPIS** Germar.

P. sericeus Stal. Raleigh, May 5, 1904.

Genus **SCHUMANNIA** Champion.

S. mexicana Champ. Raleigh. Taken in June by Mr. F. Sherman.

This is a most interesting record, as the only other appears to be the Mexican locality of the type specimen.

Genus **STENOPODA** Laporte de Castelnau

S. culiciformis Fabr. Raleigh, September 14, 1905, and May 31, 1906

Genus **REDUVIUS** Lamarck.

R. personatus Linné. Raleigh. Taken by Mr. Sherman in July

Genus **CONORRHINUS** Laporte de Castelnau

C. sanguisugus Lec. Has been taken about Raleigh in June, July and and August, but is not uncommon

Genus **MELANOLESTES** Stal.

M. abdominalis H. S. Raleigh, June 22 and October 31, 1904.

This species is not uncommon under stones, taken in winter.

M. picipes H. S. Raleigh.

Common under dead bark of standing pines, but not as a rule, unless the space under the bark is rather damp. This species has been taken from October to December and in January, March and April.

Genus **RASAHUS** Amyot et Serville.

R. biguttatus Say. Raleigh. Taken in July by Mr. Sherman.

Genus **SIRTHENEA** Spinola.

S. carinata Fabr. Lake Ellis, May 14, and Raleigh, Sept. 14, 1906.

Genus **ECHTRICHODIA** Lep. et Serville.

E. cruciata Say. Raleigh. October to January.

Found under prostrate logs in winter, but not uncommonly.

Genus **HAMMATOCERUS** Burmeister.

H. purcis Drury. Raleigh.

Taken in November, December, January and August. Not uncommon under bark of dead pines in winter; both nymphs and adults are then found but the latter more abundantly.

Genus **APIOMERUS** Hahn.

A. crassipes Fabr. Raleigh, June 24, 1904; a nymph on April 3, 1905.

Genus **ZELUS** Fabricius.

Z. luridus Stal. Raleigh, August 25, 1904; July 18, August 8, 1906.

Genus **MILYAS** Stal.

M. cinctus Fabr. Raleigh.

This form has been taken as adult in April, August, September, October and December; the nymphs in June and July. This is quite a common species.

Genus **ACHOLLA** Stal.

A. multispinosa De Geer.

Raleigh, September. This is another of Mr. Sherman's captures.

Genus **SINEA** Amyot et Serville.

S. diadema Fabr. Raleigh. Has been taken in May, June, July, Aug., Sept., Oct., Nov., and is common.

Family GERRIDAE.

Subfamily Veliinae.

Genus **VELIA** Latreille.

V. stagnalis Burm. Raleigh, August 5, 1905.

One specimen only of this interesting species.

Genus **RHAGOVELIA** Mayr.

R. obesa Uhler. Raleigh, May 20, 1905.

Quite a series of this species was caught on that day, all unwinged. Also taken on June 5, 1906.

Genus **MICROVELIA** Westwood.

M. americanum Uhler. Raleigh, April 11, March 16, 1906.

Genus **MESOVELIA** Mulsant and Rey.

M. mulsanti White. Lake Ellis, May 14, 1906.

Subfamily Gerrinae.

Genus **GERRIS** Fabr.

G. conformis Uhler. Raleigh, May 5, 1904, May 2, 1905, also taken April 11, 1906, April 15, 1905, August 5, 1905, and at Lillington, June 8, 1906.

An ample series of this species has been secured. It appears to replace our northern *G. remigis* in the south.

G. marginatus Say. Raleigh, March 25, May 18, 1905, April 31, 1906, Lake Ellis.

G. canaliculatus Say. Raleigh, March 24, 25, May 18, October 16, 1905, October 31, 1904.

Genus **TREPOBATES** Uhler.

T. pictus H. S. Raleigh, August 5, 1905.

Genus **RHEUMATOBATES** Bergroth

R. rileyi Bergr. One at Milburnie on Neuse River, some five miles from Raleigh, August 5, 1905.

Subfamily Hydrometrinae.

Genus **HYDROMETRA** Latreille.

H. martini Kirkaldy (= *lineata* Say). Raleigh, August 5, 1905. Lake Ellis, May 13, 1906.

Family NEPIDAE.

Genus **RANATRA** Fabr.

R. fusca Palisot de Beauvois. Raleigh, May 1, 1905, also a long series in 1900, or thereabouts.

This series was taken in a pool in woods alongside of the creek, and it had a great many dead leaves in it, among which were numbers of *R. fusca*. Since then there has been taken only the other specimens mentioned above, and one each on April 1, 1905, November 15, 1905, and November 11, 1904.

R. kirkaldyi Bueno. Raleigh, March 27 (1), 29 (1), 1905; February 26 (2), April 12 (2), 1906, also one in late December, 1904.

Family MACROCEPHALIDAE (=PHYMATIDAE Olim).

Genus **PHYMATA** Latreille,

P. fasciata Gray (=*wolfii* Stal et Auctt.). Raleigh, May 2, 1905, and in May, June, August and September.

Family ARADIDAE.

Genus **ARADUS** Fabr.

A. acutus Say. Raleigh, November 17, 1905, Southern Pines, March 26, 1906.

A. cinnamomeus Panzer. Southern Pines, March 26, 1905. Two winged specimens.

A. inornatus Uhler. Raleigh, February 17, 1906.

Genus **MEZIRA** Amyot et Serville (=**Brachyrhynchus** Lap. de Castlenau).

M. granulatus Say. Raleigh, November 17, 1905.

Genus **NEUROCTENUS** Fieb.

N. simplex Uhler. Raleigh, February 10, 1906. Several.

Family LYGAEIDAE Kirkaldy (=COREIDAE Leth. and Sev.).

Genus **CORYNOCORIS** Mayr.

C distinctus Dallas. Raleigh, in November.

Genus **ARCHIMERUS** Burmeister.

A. calcarator Fabr. Raleigh, in September and October. Rare.

Genus **ACANTHOCERUS** Palisot de Beauvois (=**Euthoctha** Mayr.).

A. galeator Fabr. Raleigh, April to June.

Not uncommon in suitable situations.

Genus **ACANTHOCEPHALA** Laporte de Castelnau (= **Metapodius** Auctt.)

A. terminalis Dallas. Raleigh, June 5, 1905.

One specimen only.

A. femorata Fabr. Raleigh.

This and the preceding are not uncommon from May to October. The junior author had on January 30th of this year a living specimen of this species, which was put in a bottle with some green leaves in October of last year (1906), and had since then been subject to freezing temperatures several times, surviving them till the date mentioned.

Genus **LEPTOGLOSSUS** Guérin.

L. phyllopus Linné. Raleigh.

Has been taken on Yucca in May and June; on asparagus in June; on *Datura stramonium* August 19 to November 2. It sometimes infests tomatoes. From what he noticed of the adults in the autumn of 1906, the junior author is of the opinion that they do not hibernate either as adults or nymphs.

L. oppositus Say. Raleigh.

Has been taken in July on plum, and later on on *Datura*. Two or three were taken in sunny places among dead leaves on October 26, 1906.

L. corculus Say. Raleigh.

One specimen on November 10, 1606. Another taken on March 1, 1904, was found under a log, apparently hibernating.

Genus **CHARIESTERUS** Laporte de Castelnau.

C. antennator Fabr. Raleigh.

Found in May to July and in September.

Genus **ANASA** Amyot and Serville.

A. armigera Say. Raleigh.

June to October. Not as common as *tristis*.

A. tristis DeG. Raleigh.

Occurs on squash vines from June (the first adults and eggs were noted on June 5, 1906), till September. Hibernates under bark.

Genus **ALYDUS** Fabricius.

A. eurinus Say. Raleigh, September 22, 1904.

A. pilosulus H. S. Raleigh.

This and the preceding occur from June to December; and in November and December may be found *in cop.* in sunny places.

A. quinquespinosus Say. Raleigh.

Two specimens only, both taken in September.

Genus **HARMOSTES** Burmeister.

H. reflexulus Stal. Raleigh.

Taken in May, June, August, September and November.

Family CIMICIDAE (= PENTATOMIDAE Auctt.).

Genus **CORIMELAENA** White.

C. nitiduloides Wolff. Raleigh, May 29, 1905.

C. gillettii Van Duzee. Raleigh, June 8, 1905.

One only of this interesting species, which was very kindly determined for us by its author.

Genus **TETYRA.**

T. bipunctata H. S. Raleigh, April 15, 1904, and April 4, 1906.

Genus **HOMOEMUS** Dallas.

H. grammicus Wolff. Raleigh, June 3, 1904.

Genus **PODOPS** Laporte de Castelnau.

P. cinctipes Say. Raleigh, January, 1906.

Genus **PANGAELUS.**

P. uhleri Signoret. Raleigh, April 22.

One specimen only.

Genus **SCHIRUS** Amyot et Serville.

S. cinctus Pal. Beauv. Raleigh, March 4, April 20, May 31, and June 2, 1904.

This appears to be a common form.

Genus **BROCHYMENA** Amyot et Serville.

B. quadripustulata Fab. Raleigh, June 14, 1904.

Very common under bark of dead pine trees in company with wasps of the genus *Polistes*. Outnumbers the next species ten to one.

B. myops Stal. Raleigh, in November, December, January and April.

Of this species, so rare that at the date of his annotated list in 1903, Mr. Van Duzee had not seen the form, long series have been taken under bark. Excepting *quadripunctulata* it appears to be the commonest form of the genus about Raleigh. Its chosen habitat appears to be in the neighborhood of streams.

The determination of the species is due to the valued courtesy of our friend, Mr. E. P. Van Duzee.

B. harrisii Uhler. Raleigh, November 30, 1905.

B. annulata Fabr. Raleigh, November 20, 1905.

B. arborea Say. Raleigh, April 29, 1905.

Genus **PERIBALUS** Mulsant et Riley.

P. limbolarius Stal. Raleigh, October 23, 1903, October 12, 1904.

This has not been recorded previously from N. Carolina.

Genus **TRICHOPEPLA** Stal.

T. semivittata Say. Raleigh, June, July, October, November. Not common.

Genus **MORMIDEA** Amyot et Serville.

M. lugens Fabr. Raleigh. Occurs commonly from May to December.

Genus **OEBALUS** Stal.

O. pugnax Fabr. Raleigh, March to October. Common.

Genus **EUSCHISTUS** Dallas.

E. tristigmus Say. Raleigh. Occurs from April to July and in October and November.

Var. *pyrrhocerus* H. S. Raleigh, August 3, 1904.

One specimen of this southern form of our commonest species.

E. servus Say. Raleigh. Taken from April till October, and also in January.

E. ictericus Linné. Raleigh, August 3, 1904. One specimen.

Genus **PROXYS** Spinola.

P. punctulatus Pal. Beauv. Raleigh, March 2, 1904.

Genus **HYMENARCYS** Amyot and Serville.

H. nervosa Say. Raleigh, in March, April, May and July. Not very common.

H. aequalis Say. Raleigh, June 3, 1904.

Genus **NEOTTIGLOSSA** Kirby.

N. sulcifrons Stal. Raleigh, May 2, 1905.

Genus **COSMOPEPLA** Stal.

C. carnifex Fabr. Raleigh. Taken in July by Mr. Franklin Sherman.

Genus **THYANTA** Stal.

T. custator Fabr. Common about Raleigh from April to December.

Genus **MURGANTIA** Stal.

M. histrionica Hahn. Common from April to November in the vicinity of Raleigh.

Genus **NEZARA** Amyot and Serville.

N. hilaris Say. Raleigh, May to October. Not common.

Genus **BANASA** Stal.

B. dimidiata Say. Raleigh. Taken by Dr. E. B. Wilson, May 29, 1906.

Genus **STIRETRUS** Laporte de Castelnau.

S. anchorago Fabr. Raleigh, May 24, June and July 2, 1902.

Genus **MINEUS** Stal.

M. strigipes H. S. Raleigh, May 2, 1906, and May 3, 1904.

Genus **PODISUS** Herrich-Schaeffer.

P. maculiventris Say. Raleigh. In April, and August to October. Not uncommon.

Genus **EUTHYRHYNCHUS** Dallas.

E. floridanus Linné. Southern Pines, Manee collector ; and Southern Wake Co , July 3, 1906, by F. Sherman.

An absolutely sure method of preservation of natural scientific collections against insect enemies.

By Geo. W. Bock. M. D.

Years ago, when I commenced to collect Coleoptera, I frequently found my treasures destroyed by larvae of *Anthrenus*, *Dermestes*, *Trogoderma* and other insect enemies, and I asked my friend, the late Hugo Soltau, an as enthusiastic entomologist as ever lived, for a good and reliable preservative. He advised me to read an article written by John Leconte, published in the American Naturalist, Vol. iii, A. D. 1870. In consequence I tried all chemicals mentioned, painted the boxes inside, sprayed the beetles, etc., but without the promised results. Some of the procedures were connected with so many disadvantages as to make them impracticable, others again too elaborate to be of practical use. Soltau himself used so-called moth-balls, containing mostly napthaline, but I found them absolutely without any value. I even once saw an *Anthrenus* larva crawling lustily on top of one of these cones. Subsequently I experimented with other drugs and found that the following methods of disinfecting infected material and treatment of the collection boxes will keep the collection absolutely free of any insect pest.

I disinfect every bit of material that is sent to me before mounting it and placing it in the collection. The method I use for this purpose is not my own, and was recommended by Riley. I place the material in an air-tight box (a well-made Smith-box will do), in the middle of which I place a glass or porcelain cup (such a one that is used for holding microscopical preparations, about one to two inches in diameter and one inch high will do), fill it partly with bisulphide of carbon and allow the material to stay in closed box for twenty-four hours. Do not operate with the bisulphide near an open light as it is very explosive. After this treatment I mount the material and put the insects in the collection boxes. In each of these boxes I place a common thimble, to the base of which I have soldered a short and strong pin, so as to stick the thimble in a corner of the box. I fill this little receptacle loosely with medicated cotton (entfettete Watte) and then pour in coal tar creosote so that the cotton is perfectly soaked with the drug. The thimbles have to be refilled about every six or twelve months. I generally use for filling them up a common glass dropper which can be had in any drug store, two for five cents. I have made experiments with this creosote by placing common cigar boxes filled with coleoptera on the table in an exposed room, the boxes being partly open because the covers do not close air-tight at all, and allow all kind of small insects to enter. I simply allowed half a teaspoonful of creosote running over the cork covering the bottom of the boxes, and kept them in that way absolutely free from any pest, while other boxes full of insects, but not treated with the drug, showed in a short time the ravages of different coleopterous enemies. I even found one box, having been treated three years previously with creosote, entirely free from any pest. In this method we surely find simplicity, inexpensiveness, with absolute safety for the collection combined.

* * *

PROF. J. H. COMSTOCK of Cornell University and President of the Entomological Society of America, sails for Italy this month, and will in addition probably make a trip up the Nile. He has been given a sabbatical leave of absence by the University.

A New Species of Ceuthophilus (Orthoptera) from Kansas.

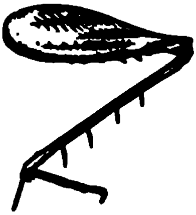
By James A. G. Rehn.

Ceuthophilus tuckeri n. sp.

Type : ♂ ; Lawrence, Douglas County, Kansas. October, at night. (E. S. Tucker.) [Coll. Univ. of Kansas.]

Allied to *C. secretus* and *varicator* Scudder, but differing from the former in the cephalic femora being less than half again as long as the pronotum, in the caudal femora being but slightly more than three times as long as broad, in the broader ventral sulcus of the same and in the longer median internal calcaria. From *varicator* it differs in the slightly broader caudal femora, in the spined latero-ventral margin of the caudal femora and in the much smaller size.

General size medium; form moderately compressed, dorsal outline distinctly arcuate; surface smooth. Head with the fastigium sharply descending, almost vertical, not sulcate, apex rounded; eyes subpyriform, the greatest width dorsad ; antennae about three times as long as the body, proximal joint broad. Pronotum, with the cephalic margin slightly emarginate mesad, caudal margin truncate. Mesonotum slightly produced, arcuate ; metanotum subtruncate. Terminal dorsal abdominal segment with a slightly elevated and thickened margin mesad; cerci slightly shorter than the pronotum, tapering, curved. Cephalic femora about a third again as long as the pronotum, ventro-cephalic margin with one to two spines on the distal portion, ventro-caudal margin unarmed ; cephalic tibiae with the dorsal face unarmed, ventral margins with four spines; cephalic metatarsi slightly shorter than the remaining cephalic tarsal joints. Median femora about equal to the cephalic femora in length, ventro-cephalic margins with two distal spines, ventro-caudal margins with a single distal spine; median tibiae with two pairs of spines dorsad and five pairs ventrad including a terminal pair; median metatarsi about equal in length to the remaining median tarsal joints. Caudal femora very slightly longer than the normal length of the body, the greatest width contained slightly more than three times in the length and also placed at about a third the distance from the proximal extremity, ventral sulcus rather broad and comparatively shallow, the lateral carina with two large spines and a number of smaller ones placed distad and proximad of the larger ones, internal carina with a number of irregular small serrato-dentate spines ; caudal tibia about a fifth again as long as the caudal femora, dorsal carinae with four pair of strongly divergent spurs, margins serrato-dentate, terminal calcaria three-paired, the median one on the lateral aspect three-fourths the length of the metatarsus, the median on the internal aspect equaling the greatest length of the metatarsus, ventral pair of calcaria on both sides shorter than the dorsal pair; caudal metatarsi as long as the remaining tarsal joints.



General color buff-yellow, overlaid with maculations of clove brown, the light color darker on the thorax than elsewhere and more tawny. Eyes and fastigium dark, a pair of fine irregular diverging dark lines extending caudad from the fastigium; antennae and palpi pale. Pronotum with median and lateral pale patches, the median ornament resembling a pair of *fleur-de-lis*, one directed cephalad the other caudad; lateral blotches irregular in shape, rather large and with a number of smaller pale spots in the immediate vicinity or in contact with them; ventral margin pale. Mesonotum and metanotum each with median and paired lateral blotches, rather irregular in shape but well defined, and with the ventral margins pale. Abdomen chiefly dark. Cephalic and median femora infuscate distad. Caudal femora with the scalariform pattern very distinct and well contrasted with the base color, caudal femora somewhat infuscate.

MEASUREMENTS.

Length of body	12.	mm.
Length of pronotum	4.	"
Length of cephalic femur	5.2	"
Length of median femur	5.2	"
Length of caudal femur	12.5	"

The type is the only specimen of this species seen. I take pleasure in dedicating the species to Mr Tucker, of the University of Kansas, who collected the type.

* * *

Dr. L. O. Howard states that the drawings for the full page plate illustrating his article in the Nov. number were made by Mr. R. E. Snodgrass.

[illegible] In the examinations of the cells of wasps [illegible] beetles under such conditions [illegible] is not wholly accidental. W[illegible] beetle larvae usually do not mature [illegible] were successfully hatched out. [illegible] cell was completely consumed [illegible] The cells were in every [illegible] the beetle larvae having [illegible] [illegible] *emarginatum* [illegible] probably *N.* [illegible] resembling that of an [illegible] identified by Prof. H. C. Fall.—A. C. Davidson, M. D., Los Angeles, Cal.

On the Distribution and Habits of some West African Bees.

BY F. CREIGHTON WELLMAN.

Some months ago I sent a small collection of Angolan bees to Professor Cockerell for determination. He has very kindly written me full information regarding them and, as none of them have heretofore been reported from this region, about half the insects being, in fact, new to science, I have thought that my field observations (which include careful notes of the plant relations and exact localities where the specimens were found) might be of interest. The numbers preceding the generic names refer to the order in which the species stand in my collecting record. The new species are marked with an asterisk (*).

179. *Apis nigritarum* Lep. Chiyaka, Angola, Dec. 20, 1906. Early rainy season. At Long. E. 15° 05′, Lat. S. 12° 44′; altitude 5000–6000 feet. Taken at various flowers, chiefly Leguminosae. This is the native domestic honey bee. The blacks make hives for it of bark, which they hang in trees. The honey is of a very pleasant flavor, especially near forests of "Omone" trees (*Brachystegiae*). These insects are of some economic importance, as beeswax is one of the chief exports of the Colony.

92. *Trigona* sp. Chiyaka, July, 1906. Very fond of damp places. Also when any gum-bearing tree is cut they appear in great numbers. The specimens sent Professor Cockerell were taken on a newly fallen gum tree (*Pterocarpus erinaceus*) in company with many Diptera, among which were *Sarcophaga albofasciata*, *S. africa*, *Anthomyia desjardensii* and *Pycnosoma chloropyga*. These bees make a very decent honey.

*174. *Megachile caricina* Ckll. Chiyaka, Dec. 20, 1906. On flowering sedges by the side of a small stream.

*170. *Gronoceras wellmani* Ckll. Chiyaka, Dec. 20, 1906. Taken at a flowering mint (*Aeolanthus suavis*).

*172. *Gr. benguellensis* Ckll. Chiyaka, Dec. 20, 1906. On Compositae (*Othonna spp.*, *Geigeria wellmani*, etc.).

171. *Anthophoa quadrifasciata* Vill. Chiyaka, Dec. 20, 1906. Stands motionless in the air like a bat fly. Taken near Con-

volvuli (*Ipomaea crassipes*) but not actually seen in the flowers Makes its nest in the ground.

*175. *An. convolvuli* Ckll. Chiyaka, Dec. 20, 1906. On Convolvulus.

*177. *Crocisa wellmani* Ckll. Chiyaka, Dec. 20. 1906. On *Aeolanthus* and also on *Orthosiphon sp.* (? *violaceus*). I think this species is parasitic on *Anthophora convolvuli* (No. 175. but I have not yet definitely proven it.

178. *Cr. meripes* Vach. Chiyaka, Dec. 20, 1906. On *Aeolanthus*. At Professor Cockerell's suggestion I have followed up the habits of this species and find that it is parasitic in the nests of *Anthophora quadrifasciata* (No. 171).

90. *Xylocopa tarsata* Sm. var. *wellmani* Ckll. Bailundu. Angola, February and March, 1906. Middle of rainy season. At Long. E. 16°, Lat. S. 12° 13′ 30″. Altitude 4761 ft. Taken at various Malvaceae, principally *Gossypium spp.*

89. *Mesotrichia mixta* Rad. Chiyaka, July, 1906. Seen at several flowers. The specimens sent were taken at a species of *Millettia*, of which they are very fond.

180. Note on a Mite Found Infesting *Mesotrichia mixta* After receiving Professor Cockerell's notes on *Mesotrichia*, I dissected several specimens of *mixta* and in each case found a peculiar pouch, opening on the basal surface of the first abdominal segment, full of mites. I sent the contents of one of these pouches (10 mites) with the specimens of bees and they have been identified as *Parasitus*...

SUPPLEMENTARY NOTE. The new species have been described in Annals and Magazine of Natural History, 1907. [illegible] I [illegible] have [illegible] but hesitate to describe as new. It is nearly [illegible] long, black, with light ferruginous hair on thorax above, clypeus [illegible] with an orange mark at each side, basal half of scape largely [illegible] yellow stripe along inner orbits, a yellow line on hind tibia, [illegible] upper edge of prothorax, and margins of mesothorax and [illegible] [illegible] abdominal segments with a large cream-colored spot [illegible] [illegible] abdominal segment extremely shiny. [illegible] resembling [illegible] [illegible] Mr Banks. T. D. A. COCKERELL.

ENTOMOLOGICAL NEWS.

[The Conductors of Entomological News solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. Entomological News has reached a circulation, both in numbers and circumference, as to make it necessary to put " copy " into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted ; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

PHILADELPHIA, PA., DECEMBER, 1907.

This number completes the eighteenth volume of the NEWS with 456 pages and 17 plates. In other words it has been in existence for eighteen years. It had a few trials in its early days but warm friends came to the rescue. Its growth has been steady and normal, and has gone along with the increased interest in the study of insects. We see no reason why the journal should not continue to be enlarged and improved, as our subscription list is larger this year than ever before. We feel that we are not receiving enough papers of a general and popular interest. We do not wish to discourage technical papers, but desire the other kind too. We fully realize that there is more in entomology than the description of new species, and we would welcome more papers on habits, collecting experiences, life histories, or the part of the study that makes interesting reading yet does not lack scientific value. Nature stories with the fake part left out would probably explain the idea. The nature-fake stories have illustrated the fact that people care for them and will read them. Can it be that the truth is less interesting ? We will be glad to hear from our subscribers who have interesting material for publication. We know that many of them could supply such articles, but perhaps their modesty forbids or they think their observations are not new. We are willing to risk censure if we republish interesting facts.

Entomological Literature.

THE GENUS EUTETTIX WITH ESPECIAL REFERENCE TO THE BEET LEAF HOPPER, A TAXONOMIC, BIOLOGIC AND ECONOMIC STUDY OF THE NORTH AMERICAN FORMS.—By Elmer Darwin Ball, Ph.D.

Reprinted from the Proceedings Davenport Academy of Sciences, vol xii, pp. 27-94, July, 1907.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MAJOR JAMES CARROLL, Surgeon, U. S. A., died September 16th, in Washington, D. C. Major Carroll was a member or the commission that proved that mosquitoes transmitted the cause of yellow fever to human beings. All honor to his memory.

CAMBRIDGE ENTOMOLOGICAL CLUB.—The Club held an exhibition of Insects on Wednesday, Thursday, Friday and Saturday, November 20, 21, 22, 23, at the rooms of the Appalachian Mountain Club, in the Tremont Building, 73 Tremont St., Boston.

THE office of State Entomologist has been separated from the chair of Zoology and Entomology of Clemson College and located at Columbia, S. C. On September 11, 1907, Prof. Chas. E. Chambliss resigned his position of Assistant Professor of Zoology and Entomology to accept the appointment of State Entomologist.

CAPTURES OF DIPTERA.—The following of my captures of flies during 1907 are of interest: *Dizonias tristis*, Washington, D. C., June 21; *[illegible]*, Glencarlyn, Va., June 28; *Pterallastes thoracicus*, Glencarlyn, Va., June 14, at *Ceanothus*; *Gymnochaeta alcedo*, Falls Church, Va., July 20; *[illegible]*, Washington, D. C., September 5; *[illegible]*, Falls Church, Va., September 30. I also took a few more specimens of *[illegible]* and *[illegible]*. The former is fairly common at some places along the Potomac river, five or ten miles above Washington.—NATHAN BANKS.

OCCURRENCE OF DILAR AMERICANA McLACH.—This rare Neuropteron of the family Hemerobiidae was described from one female taken by Sanborn in Kentucky. The type and only recorded specimen is in the Museum of Comparative Zoology. On July 20 last summer while collecting in a piece of woods near Falls Church, Va., I saw three [illegible] on the bark of a large tree. I placed a vial over two [illegible]. One I at once recognized *Dilar americana*, a [illegible] female. The [illegible] probably its mate, but is rather smaller [illegible] darker [illegible] with the pectinate antennae characteristic of the male of the genus.—N. BANKS.

WHILE opening a box of hydrochinone developer a few days ago, I found therein, on the top of the crystals, a well preserved specimen of *Plodia interpunctella*, which I suppose had accidentally gained access to the box and had died therein. On, however, emptying the box of its contents, I found near the bottom and adhering to the cardboard a well built chrysalis, the outer covering of which was composed of hyrochinone crystals, while the inner covering or sheath was composed of the usual silk web. What adds interest to the specimen, is the fact that the larva had evidently fed upon the hydrochinone crystals, as is evidenced by the presence of numerous excreta on the outside of the sheath in which pupation had finally taken place. I am aware that the larva of *Plodia interpunctella* is not very particular about what it eats, but to the best of my knowledge, this is the first that I ever heard of its feeding and thriving upon a chemical product. I will send you under separate cover a photo of the chrysalis.—JAMES H. STEBBINS, JR., 3 W. 29th St., New York.

GEOMETRID NOTES.—Having occasion to go over some of the Packard types I noticed his type of *Gonodontis apiciaria* was very distinct from *warneri* of Harvey Bull. Buff. Ent. Soc. II, 121, 1874, and is incorrectly placed as a synonym of the latter. Packard described the species from 2 ♂ and 2 ♀ and among these he has *warneri*, but the ♂ figured, Plate 12, fig. 9, is the true type of *apiciaria*. He refers to this in the description, page 502 of Monograph, where he says: "Accompanying and beyond this line is a broken broad diffuse band (here he refers to *warneri*) often obsolete, in one ♂ entirely so (here to *apiciaria*). The true *apiciaria* is very distinct in that there is a deep sinus in the hind wings of ♂ and ♀, the portion beyond the extra discal line of fore and hind wings is pale ash gray and reddish inwardly. The extra discal line is never sinuous and runs almost straight across the wings and farther in, than in *warneri*. It lacks all shading to extra discal line and the costal apical spot is wanting. In fact *apiciaria* is so distinct that it could not have even varietal standing but must be placed in specific rank. It is rather a rare species as I know of only about eight specimens, three being in my collection the others scattered through the country. Perhaps I am more fortunte than most people working on the Geometridæ to have access to the Packard types in Cambridge and I would like to state here for the benefit of those who may visit there, that all specimens labeled types, are not true types. Packard was in the habit of putting type labels on everything meaning typical of his collection even to specimens of the same species added to his collection after his description. But fortunately he was extremely careful in labeling so that if one goes by the original descriptions he can easily locate the types by locality and date. I speak of this so that there may be few chances in the future for errors in this difficult group. I wish to thank Mr. E. J. Smith, of Natick, Mass., for courtesy in extending to me the use of his specimens and records.—L. W. SWETT.

Birds vs. Insect.—The following letter is self-explanatory. The insect referred to proved to be the common giant water bug or electric light bug (*Belostoma americana*). The predaceous habits of this insect are well known. Numerous instances are recorded in literature of its attacking fishes, but that it attacks birds has not, so far as I know, been previously recorded. In order that this observation may be more widely known, Mr. Lawrence has kindly given me permission to use his letter.—Robert Matheson, 804 E. Seneca St., Ithaca, N. Y.

Huron, South Dakota, May 17, 1907

Hon. Robt. L. Slagle,
Pres. S. D. Agricultural College,
Brookings, South Dakota.

My Dear Mr. Slagle:—I have a curiosity which I am sending you under separate cover and will explain the circumstances under which I obtained it.

About one o'clock to-day, the man I have working around my yard came to me with a woodpecker in his hand. The special species of woodpecker I am unable to tell you; the ordinary woodpecker, or "flicker" as we sometimes call it, that runs up and down trees and hunts out bugs and worms, etc. The man told me, while he was standing near a tree this woodpecker uttered cries of distress and fluttered and fell down out of a tree near where he was standing. On picking the bird up he was surprised to find a very large bug attached to the woodpecker's head. That is, the big bug had inserted its beak, or whatever it may be, into the back part of the head of the woodpecker, apparently through the skull, and when it came to me the insect was firmly attached to the woodpecker's head in that way, and was [illegible] engaged in sucking the blood or brains of the woodpecker. In addition to the insertion of its beak into the back part of the [illegible] of the woodpecker, it had wrapped its several pairs of [illegible] around [illegible] the woodpecker, holding it [illegible]

My hired man put his foot on the insect to make sure of killing [illegible] and [illegible] from the head and send it down [illegible] which [illegible] know anything about the [illegible] rates, and if they are in the habit of [illegible] on woodpeckers [illegible] or whether it might have been [illegible] part of the woodpecker which [illegible] was too much for him. [illegible] what [illegible] people [illegible] it [illegible] which [illegible] the South Dakota [illegible] I [illegible] and [illegible] it [illegible] I [illegible] glad to hear from you regarding [illegible] same.

Yours sincerely,

PHILIP LAWRENCE.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.—Announcement of Annual Meeting at Chicago. The Entomological Society of America will hold a meeting December 30 and 31, at the University of Chicago, in connection with the meetings of the American Association for the Advancement of Science and the other affiliated scientific societies. Members are urged to be present and to contribute to the program. Abstracts of proposed communications should be mailed to the Secretary at the earliest moment, otherwise they may not be received in time for inclusion in the joint program of all the societies which is to be printed this year.

The by-laws provide that there shall be held at the annual meeting a technical exhibit of entomological materials and methods. Any photographs, drawings, specimens, novelties, apparatus or other matter of interest to entomologists which persons may wish to exhibit will be heartily welcomed.

This exhibit will remain open the entire period of the meeting, for the examination, at their leisure, of those interested. If you cannot attend, send your exhibit to the Secretary, in care of the American Association for the Advancement of Science, at the University of Chicago. The annual address will be given by Professor Herbert Osborn, of the Ohio State University on Monday evening, December the thirtieth. The business meeting will be held Tuesday morning, December the 31st. The same hotel arrangements and railroad rates enjoyed by members of the American Association and other societies will be accorded to the members of our society. While it is too early to make definite announcements in regard to these, it has in the past, and presumably again will be, the custom of the railroads to grant a rate of one fare and one-third + twenty-five cents for the round trip. Ask your agent for a certificate upon purchasing your ticket, and this must be validated by the special agent in attendance at the meetings, for which a fee of twenty-five cents will be charged. You will then be sold a return ticket for one-third the regular fare.

The meetings of the Association of Economic Entomologists will be held on Friday and Saturday, December 27 and 28. Blanks for the abstracts of papers to be read, for titles of proposed exhibits, and for nomination of new members will be sent upon request.

J. CHESTER BRADLEY, J. H. COMSTOCK,
Secretary-Treasurer. *President.*

RANDOM ENTOMOLOGICAL NOTES.—The larva of *Sibine stimulea* Clemens has been found by a correspondent at Latrobe, Pa., feeding upon the leaves of the Castor oil plant (*Ricinus communis*). This is believed to be a new record.

From a correspondent in Wisconsin the writer recently received a quill containing a number of the eggs of *Erebus odora.* A male and a female of this species were captured and placed in a box. The female oviposited and the eggs proved to be fertile. Unfortunately the writer was not at home when the eggs were received. Upon his return he found that the larvæ had already escaped from the eggs. A diligent attempt was made to find some food-plant upon which they would feed, but every effort failed. Plants belonging to over thirty families were tried, but without success. Unfortunately the fact that the larva feeds upon plants of the genus *Cassia* was overlooked. This should be borne in mind, hereafter by those who may be as fortunate as was my correspondent in securing ova of this species in the northern states.

The small larvæ are loopers, distinctly geometrid in appearance. The head is long vertically and narrow transversely. They were black in color with the anal prolegs, which are elongated of a pale reddish color.

The army-worm, *Leucania unipuncta*, has been very numerous this summer in the eastern suburbs of the city of Pittsburgh. Several fields of grass and growing grain seen by the writer at the end of June and early July were almost completely defoliated by the larvæ, which were present in incredible numbers.

The hispid beetle *Odontota dorsalis*, Thunberg, is always common in Western Pennsylvania upon the leaves of the locust trees, *Robinia pseudacacia*, but this year they have been present in unusual numbers. Inquiries have been frequently addressed to the writer as to these insects, and along the upper waters of the Ohio, at Sewickley, Pa., and other suburban localities the locust trees have in places been almost stripped of their leaves by them. A single stroke of the beating-pole will sometimes bring a thousand individuals down into the umbrella of the collector.—W. J. HOLLAND.

◆

ERRATUM

Page 261, line 19, for "Cicindelidae" read "Coccinellidae."

◆

Doings of Societies.

A meeting of the American Entomological Society was held June 27, 1907. Dr. P. P. Calvert, President, in the chair. Thirteen persons were present.

Mr. Laurent said insects became more abundant this year in Florida during March. He said he believed the best season in that State was from the middle of April to the middle of July.

Dr. Calvert asked whether northern species found in the tropics have the same number of annual broods as here, or if the broods follow in continuous succession. Discussed by the members.

Mr. Fenninger reported the capture of *Microdon aurifex*, taken at the Forked River Mountains, N. J., July 9, 1906. It was said not to have previously been taken north of Mexico.

Dr. Calvert exhibited male and female specimens of *Argia translata* from Ecuador. They did not show any geographical variation from those found in the United States. He commented on the wide geographical range of the species. He also showed a male *Perilestes* from Surubres, Costa Rica, by Professor Biolley, a genus hitherto known only from Essequibo, Guiana, and Brazil, and pointed out its chief venational characters.

Mr. Viereck recorded *Hermetia illucens*, a South American Dipteron, taken at Philadelphia. He also said *Andrena nasoni* showed considerable geographical variation. The western forms may be considered as two subspecies. Other species of *Andrena* which also show geographical variation were mentioned.

Mr. Rehn said some species were more plastic than others, and this fact should be considered.

A meeting of the American Entomological Society was held October 10th. Dr. P. P. Calvert, President, in the chair. Thirteen persons were present.

Mr. Viereck said he saw a frog at Tucker's pond, near Devon, Pa., in the act of swallowing a dragon fly. He rescued the insect and found it to be *Gomphus sordidus*. This habit of a frog was new to the speaker.

Mr. Haimbach recorded the capture by Mr. Harbeck of *Caripeta angustiorata* at Clementon, New Jersey, in May.

Dr. Calvert exhibited an egg capsule of one of the larger cockroaches, *Periplaneta* or *Blatta*, which had been firmly attached to the fluted moulding of a bookcase in such a way that the capsule lay in a vertical groove whose width was about equal to the height of the capsule, the longest axis of the capsule being vertical. The mother had almost covered the exposed surface of the capsule with white paper (although the moulding was dark brown), which had evidently been obtained from a newspaper hanging near by, as the paper had been gnawed into several holes, the nearest hole being a half inch from the egg capsule. When the speaker first saw the capsule he did not recognize it owing to its white color, and pulled it off with a forceps, part of the capsule wall remaining on the moulding. The capsule being thus opened, the embryos, which were nearly ready to hatch, began to free themselves, when the speaker dropped the whole into Gilson's acetic alcohol sublimate mixture, which killed and fixed the embryos in their natural positions. He also spoke of his most recent work on the Odonata for the Biologia Centrali-Americana as being that of summarizing the geographical distribution of the species with reference to elevation, temperature, rainfall and drainage-slopes. The numbers of species found in the different States of Mexico were given to show in what parts of that country our knowledge was most deficient.

Dr. F. Creighton Wellman of Benguella, West Africa, was elected a member. HENRY SKINNER, *Secretary*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 23d, Mr. Philip Laurent, Director, presiding. Twelve persons were present. Dr. Calvert exhibited specimens of *Libellula*, and said *flavida* Ramb. had been described from an unknown locality. The species identified by Hagen as *flavida*, was not the *flavida* of Ramb. The speaker had redescribed the *flavida* of Hagen under the name *comanche*. Dr. Calvert asked where the most southern forms of insects were found in Pennsylvania. The prevailing opinion among the members present was that the lower Susquehanna valley gave more of these forms than any other locality.

A meeting was held Sept. 26th, Mr. Laurent, Director, presiding. Fourteen members and two visitors were present. Mr. Laurent exhibited a specimen of *Celithemis fasciata* taken at Malaga, N. J., July 20th. Specimens of this species have been taken by Mr. Daecke in other localities in the same State. Mr. Rehn exhibited a specimen of *Chiralltis conspersa* taken by Mr. C. M. Greene, ovipositing in dead beech wood at Angora, Penna. This is the first record south of the mountain parts of the State.

Mr. Wenzel exhibited specimens of Coleoptera taken by his son, H. A. Wenzel, in the Huachuca Mountains, Cochise Co., Arizona. *Crioprosopus magnificus* and *Cicindela santaclarae*, the latter in both the green and brown forms, *Pasimachus mexicanus*, *Amblychila baroni* were shown. The latter were found under stones. Over fifty species of Coccinellidae were taken.

Dr. Skinner exhibited some Coleoptera from Manitoba and Saskatchewan, among them being *Cicindela manitoba*, *cinctipennis* and *limbata*.

Mr. Rehn spoke of his trip in the southwest in conjunction with Mr. Hebard. They brought back about four thousand specimens of Orthoptera. He said tubes were much better than envelopes for the grasshoppers. Some of the material was exhibited.

Mr. Daecke exhibited *Orchelimum minor* which he found ovipositing in pine at Brown's Mills, N. J., Sept. 15th. He also reported *Dendrotettix quercus* from Bamber, N. J., Aug. 17th, heretofore not known from the Atlantic coast.

HENRY SKINNER, *Recorder*.

Meeting of the Brooklyn Entomological Society, 55 Stuyvesant Avenue, Brooklyn, New York, June 6th, 1907. President Dr. Zabriskie in the chair; sixteen members and three visitors present.

Mr. Dow continued his address delivered before the Society in April, on "The Dignity of Nomenclature." Fabricius, who was quoted as having followed in the footsteps of his tutor, Linnæus, had a coterie of children and young people, whose names he would sometimes apply to insects, as, for example, "*Vanessa*" and "*Thecla*." His adoption of popular terms, such as "woolly bear" or "wolf," can be recognized in *Arctia* and *Lycaena*.

Among the names by other authors mentioned as particularly appropriate were: *Hadena*, a nightflyer, by Schranck, and *Agrotis*, *field-workers*, by Ochsenheimer.

In a general discussion, following the address, the use of descriptive names was endorsed.

GEO. P. ENGELHARDT, *Rec. Sec.*

At the meeting of the Feldman Collecting Social, held on October 16th, at the residence of Mr. H. W. Wenzel, 1523 S. Thirteenth Street, Philadelphia, there were ten members present, and Mr. Peters visitor.

Dr. Skinner exhibited specimens of a local race of *Cicindela vulturina* from Fort Wingate, West New Mexico, which are larger, more heavily marked and darker green than the green variety of *vulturina* known as *santaclarae*. Black forms were also received.

Mr. Haimbach exhibited a few of the moths collected in the past summer by Messrs. Kaeber and Wenzel, Jr., in Southern Arizona, also a fine pair of *Caripeta angustiorata* Wlk., a rare Geometrid, collected by Mr. Harbeck at Clementon, N. J., May 30, '07.

Mr. Viereck said that out of about 250 specimens of Connecticut Braconidæ (Hymenoptera), recently examined by him, over fifty species proved to be new. Among the specimens were some species of *Lysiphlebus*, a genus that is parasitic on plant-lice, and that has been divided into species groups by Dr. Ashmead, on the number of joints to the antennæ. Mr. Coquillett, in an article in Insect Life, disputes the validity of some Ashmeadian species based on the above character, claiming that the number of joints to the antennæ is too variable to be of value, and gives, in support of his theory, observations made upon *Lysiphlebus* species bred from colonies of Aphids, of which the specimens of each colony were taken from the same bush. He examined over 100 specimens of *Lysiphlebus* from two colonies, and of this number less than four per cent. showed more joints on one antenna than on the other, of the same species. Mr. Viereck remarked that, in view of the fact that Mr. Coquillett's findings are not based on generations from known parents, he is inclined to regard Mr. Coquillett's view as a counter theory to that of Dr. Ashmead, and for the present prefers to stick to the latter.

Mr. Daecke exhibited his collection of Trypetidæ (Diptera), and spoke on the gall-making of some of the trypetid species.

FRANK HAIMBACH, *Secretary*

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